Vol. 917 Number 4

OFFICIAL GAZETTE

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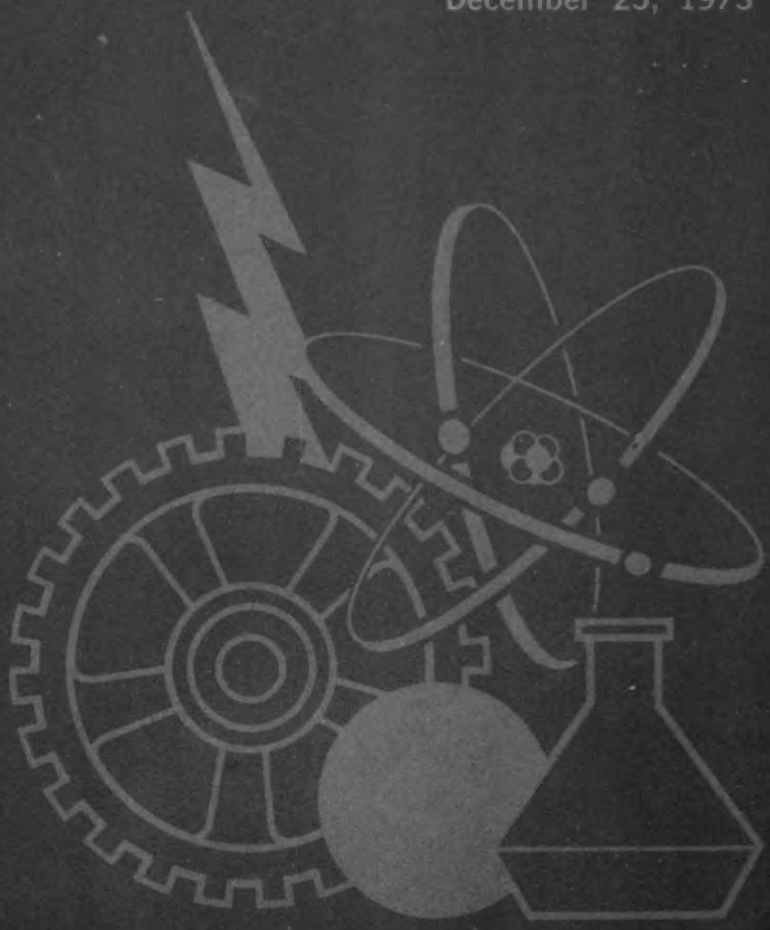
PATENTS

December 25, 1973



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 25, 1973 Volume 917 Number 4

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PATENT NOTICES

Certificates of Correction for the Week of Dec. 25, 1973

Re. 27,710	3,723,470	3,744,284	3,754,972
D. 228,247	3,723,546	3,744,402	3,755,161
D. 228,255	3,723,970	3,744,403	3,755,310
D. 228,331	3,724,413	3,744,541	3,755,590
D. 228,390	3,724,580	3,744,649	3,755,711
D. 228,410	3,725,024	3,744,773	3,756,060
D. 228,470	3,725,270	3,744,816	3,756,134
3,532,519	3,725,296	3,745,008	3,756,228
3,559,825	3,726,688	3,745,041	3,756,407
3,562,334	3,726,714	3,745,129	3,756,418
3,574,543	3,726,933	3,745,594	3,756,457
3,578,819	3,726,938	3,745,828	3,756,976
3,601,556	3,727,865	3,745,951	3,756,993
3,615,989	3,728,174	3,745,962	3,757,084
3,621,027	3,728,288	3,746,071	3,757,184
3,626,012	3,728,336	3,746,437	3,757,324
3,638,484	3,729,497	3,746,650	3,757,353
3,647,845	3,729,715	3,746,698	3,757,428
3,652,979	3,729,903	3,746,797	3,757,429
3,655,345	3,730,178	3,746,867	3,757,472
3,655,397	3,730,560	3,747,108	3,757,502
3,657,263	3,730,979	3,747,180	3,757,640
3,660,303	3,731,113	3,747,311	3,757,653
3,663,526	3,731,432	3,747,354	3,757,867
3,669676	3,731,719	3,747,542	3,757,886
3,670,119	3,732,055	3,747,659	3,758,186
3,671,540	3,732,173	3,747,664	3,758,298
3,671,917	3,732,247	3,747,765	3,758,334
3,672,819	3,732,604	3,747,770	3,758,351
3,673,278	3,732,633	3,748,184	3,758,566
3,675,040	3,732,992	3,748,329	3,758,593
3,676,234	3,733,326	3,748,447	3,758,615
3,676,384	3,733,934	3,748,749	3,758,739
3,677,963	3,734,166	3,748,972	3,758,825
3,679,548	3,734,188	3,749,138	3,758,838
3,681,482	3,734,252	3,749,477	3,758,840
3,681,688	3,734,516	3,749,606	3,758,879
3,683,084	3,734,866	3,749,767	3,758,992
3,686,158	3,734,934	3,749,810	3,759,143
3,688,555	3,734,977	3,749,939	3,759,145
3,688,724	3,735,054	3,749,975	3,759,148
3,690,992	3,735,196	3,750,090	3,759,414
3,691,258	3,735,473	3,750,110	3,759,492
3,692,557	3,735,799	3,750,309	3,759,511
3,694,442	3,735,941	3,750,448	3,759,594
3,694,510	3,736,149	3,750,464	3,759,885
3,699,500	3,736,981	3,750,562	3,759,893
3,700,198	3,737,301	3,750,623	3,759,911
3,701,603	3,737,338	3,750,698	3,759,996
3,701,675	3,737,376	3,750,717	3,760,055
3,703,288	3,737,566	3,750,988	3,760,071
3,703,758	3,738,150	3,751,093	3,760,148
3,704,270	3,738,354	3,751,269	3,760,276
3,706,875	3,738,735	3,751,424	3,760,297
3,707,555	3,739,054	3,751,432	3,760,328
3,709,667	3,739,160	3,751,444	3,760,412
3,709,928	3,739,195	3,751,603	3,760,457
3,710,113	3,739,310	3,751,626	3,760,627
3,712,360	3,739,700	3,751,892	3,760,645
3,712,680	3,740,237	3,752,289	3,760,890
3,712,911	3,740,281	3,752,368	3,760,974
3,715,393	3,740,463	3,752,370	3,761,305
3,716,582	3,740,478	3,752,499	3,761,340
3,717,655	3,740,485	3,752,660	3,761,423
3,717,750	3,740,577	3,752,854	3,761,441
3,719,608	3,740,762	3,752,969	3,761,443
3,719,663	3,740,996	3,753,188	3,761,635
3,719,855	3,741,697	3,753,464	3,761,836
3,720,708	3,741,932	3,754,024	3,761,840
3,720,772	3,742,011	3,754,112	3,761,867
3,720,925	3,742,253	3,754,224	3,761,941
3,721,113	3,742,475	3,754,279	3,761,981
3,721,400	3,742,577	3,754,366	3,762,065
3,721,682	3,742,660	3,754,400	3,762,614
3,722,036	3,743,098	3,754,404	3,762,697
3,722,714	3,743,555	3,754,452	3,762,962
3,723,166	3,743,576	3,754,813	

Dedications

2,746,729.—*Merle M. Eakins,* Ford City, Pa. METHOD FOR HOMOGENIZING GLASS. Patent dated May 22, 1956. Dedication filed July 25, 1973, by the assignee, *PPG Industries, Inc.*

Hereby dedicates the remainder of its term to the free use and benefit of the People of the United States.

2,748,441.—*William G. Smith,* Tarentum, Pa. QUICK ACTION CLAMP DEVICE. Patent dated June 5, 1956. Dedication filed July 25, 1973, by the assignee, *PPG Industries, Inc.*

Hereby dedicates the remainder of its term to the free use and benefit of the People of the United States.

2,750,161.—*Ralph W. Simmons,* Ford City, Pa. METHOD FOR STIRRING GLASS. Patent dated June 12, 1956. Dedication filed July 25, 1973, by the assignee, *PPG Industries, Inc.*

Hereby dedicates the remainder of its term to the free use and benefit of the People of the United States.

2,750,312.—*James H. Bloom, Jr.,* and *Wyman N. Connor,* New Kensington, Pa. METHOD OF FABRICATING LAMINATED STRUCTURES. Patent dated June 12, 1956. Dedication filed July 25, 1973, by the assignee, *PPG Industries, Inc.*

Hereby dedicates the remainder of its term to the free use and benefit of the People of the United States.

2,764,848.—*Florian V. Atkeson,* Tarentum, Pa. IMPROVED GLASS CUTTING METHOD. Patent dated Oct. 2, 1956. Dedication filed July 25, 1973, by the assignee, *PPG Industries, Inc.*

Hereby dedicates the remainder of its term to the free use and benefit of the People of the United States.

3,466,812.—*Alec Leibowitz,* London, England. HOLDERS FOR GEM STONES. Patent dated Sept. 16, 1969. Dedication filed Sept. 7, 1973, by the assignee, *Spectrum Diamonds (Proprietary) Limited.*

Hereby dedicates the entire remaining term of said patent to the Public.

3,466,813.—*Alec Leibowitz,* Marylebone, London, England. HOLDERS FOR GEM STONES. Patent dated Sept. 16, 1969. Dedication filed Sept. 7, 1973, by the assignee, *Spectrum Diamonds (Proprietary) Limited.*

Hereby dedicates the entire remaining term of said patent to the Public.

3,540,190.—*Joseph A. Brink, Jr.,* St. Louis, Mo. LIQUID MIST COLLECTION. Patent dated Nov. 17, 1970. Dedication filed Aug. 9, 1973, by the assignee, *Monsanto Enviro-Chem Systems, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent

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3,543,450.—*Alec Leibowitz,* London, England. APPARATUS FOR CONTROLLING RECIPROCATORY MOVEMENT OF A GEM STONE ACROSS A POLISHING SURFACE. Patent dated Dec. 1, 1970. Dedication filed Sept. 7, 1973, by the assignee, *Spectrum Diamonds (Proprietary) Limited.*

Hereby dedicates the entire remaining term of said patent to the Public.

3,548,190.—*Charles B. Sclar*, Columbus, and *Paul J. Freud*, Worthington, Ohio. HIGH PRESSURE APPARATUS FOR USE IN X-RAY DIFFRACTION ANALYSIS. Patent dated Dec. 15, 1970. Dedication filed May 7, 1973, by assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,551,992.—*Daniel J. Maykuth* and *Horace R. Ogden*, Columbus, Ohio. METHOD OF PRODUCING DUCTILE-TUNGSTEN BASE SHEET ALLOY. Patent dated Jan. 5, 1971. Dedication filed May 7, 1973, by the assignee, *The Battelle Development Corporation*.

Hereby dedicates to the People of the United States the entire remaining term of said patent.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 2,763,716, K. E. Farr, COLOR TELEVISION RECEIVER APPARATUS, decided Jan. 13, 1961, claims 2 and 11, decided Sept. 13, 1973, claim 7, Interference No. 88,971.

Patent No. 3,457,349, A. G. Jelinek, ESTERS OF 1-AZIRIDINEPROPIONIC ACID AS TRANQUILIZERS, decided Sept. 12, 1973, Interference No. 98,349, claim 7.

Patent No. 3,484,677, M. J. Piteo, BREAKERLESS MAGNETO IGNITION SYSTEM, decided Sept. 13, 1973, Interference No. 98,080, claims 1, 4, 6 and 10.

Patent No. 3,503,261, H. A. Riester and T. Kobayashi, RESISTANCE TO CURRENT CONVERTER, decided June 26, 1973, Interference No. 97,615, claims 1, 2, 3, 4, 5 and 6.

Patent No. 3,517,370, R. Poingt, INSULATING PROTECTOR FOR CLIPS USED IN ELECTRICAL CONNECTIONS, decided Sept. 5, 1973, Interference No. 97,935, claims 1 and 2.

Patent No. 3,578,618, H. P. Beardsley, VINYL ACETATE-ETHYLENE COPOLYMER AQUEOUS PAINT COMPOSITIONS, decided Sept. 12, 1973, Interference No. 98,176, claim 1.

Patent No. 3,602,972, H. Droll, APPARATUS FOR FORMING AND TRANSFERRING COILS FOR STATORS, decided Sept. 19, 1973, Interference No. 98,264, claims 1, 2, 5, 7 and 8.

Patent No. 3,676,031, F. M. Stinton and W. M. Slater, POST-TENSIONING SYSTEM, decided Sept. 7, 1973, Interference No. 98,181, claims 1, 2, 4, 5, 6, 7, 8 and 9.

Disclaimers

Design Patent No. 217,954.—*Heinz Nathanson*, New York, N.Y. SHOWER CURTAIN HOOK. Patent dated July 7, 1970. Disclaimer filed Aug. 3, 1973, by the inventor.

Hereby disclaims the claim of said patent.

Design Patent No. 224,093.—*Elmer W. Griese, Jr.*, Chicago, Ill. CARRYING HANDLE FOR A CONTAINER OR THE LIKE. Patent dated July 4, 1972. Disclaimer filed Oct. 9, 1973, by the assignee, *National Can Corporation*.

Hereby disclaims the remaining term of said patent.

3,388,690.—*Eldon Hostetler*, Middlebury, Ind. POULTRY FEEDER SYSTEM AND PAN ASSEMBLY THEREFOR. Patent dated June 18, 1968. Disclaimer filed Oct. 9, 1973, by the assignee, *Chore-Time Equipment Inc.*

Hereby enters this disclaimer to claims 4, 6 and 7 of said patent.

3,452,269.—*Wilbur C. Welz*, Houston, Tex. METHODS AND APPARATUS FOR INVESTIGATING EARTH FORMATIONS INCLUDING ADJUSTING THE POTENTIAL DISTRIBUTION IN AN AXIAL DIRECTION THROUGH A BOREHOLE. Patent dated June 24, 1969. Disclaimer filed Oct. 11, 1973, by the assignee, *Schlumberger Technology Corporation*.

Hereby enters this disclaimer to claim 28 of said patent.

3,494,969.—*George J. Kallos*, Saginaw, Mich. PREPARATON OF STYRENES. Patent dated Feb. 10, 1970. Disclaimer filed June 4, 1973, by the assignee, *The Dow Chemical Company*.

Hereby enters this disclaimer to claims 1, 3, 5 and 8 of said patent.

3,496,122.—*Ulrich Niklaus*, Munchenstein, and *Daniel Porret*, Binningen, Switzerland. MODIFIED TRIGLYCIDYLISOCYANURATE RESINS. Patent dated Feb. 17, 1970. Disclaimer filed Apr. 11, 1973, by the assignee, *Ciba-Geigy AG*.

Hereby enters this disclaimer to claims 1, 7, 8 and 10 of said patent.

3,551,286.—*Richard G. Barker*, Princeton Junction, N.J. POLYSULFIDE PAPER PULPING COMPOSITION. Patent dated Dec. 29, 1970. Disclaimer filed Aug. 1, 1973, by the assignee, *Union Camp Corporation*.

Hereby enters this disclaimer to claims 1 through 6, inclusive of said patent.

3,553,270.—*John C. Wollensak* and *Bernard R. Meltsner*, Royal Oak, Mich. PREPARATION OF PHENOLIC THIOETHERS. Patent dated Jan. 5, 1971. Disclaimer filed Sept. 14, 1973, by the assignee, *Ethyl Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3 and 7 of said patent.

3,563,313.—*Lloyd B. Spangle*, Tulsa, Okla. WELL CEMENTING METHOD USING QUICK GELLING CEMENT. Patent dated Feb. 16, 1971. Disclaimer filed Aug. 17, 1973, by the assignee, *The Dow Chemical Company*.

Hereby enters this disclaimer to claims 1–3 of said patent.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 8, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-24-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo, Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-25-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-30-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-02-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-17-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-02-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signaling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-11-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-29-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-10-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-26-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	2-14-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-22-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-10-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters, Stationery; Information Dissemination.	1-19-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-12-73
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes, Sewing Machines.	9-25-72

Expiration of patents: The patents within the range of numbers indicated below expire during December 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,772,415 to 2,775,761, inclusive
Plant Patents ..... Numbers 1,532 to 1,542, inclusive

REISSUES

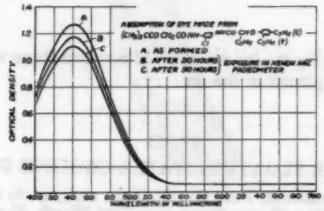
DECEMBER 25, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,848
YELLOW FORMING COUPLERS

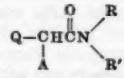
Arnold Weissberger, Rochester, N.Y., and Charles J. Kibler, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,265,506, dated Aug. 9, 1966, Ser. No. 364,450, May 4, 1964, which is a continuation-in-part of abandoned Ser. No. 25,295, Apr. 28, 1960. Application for reissue July 21, 1971, Ser. No. 164,684
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 15 Claims



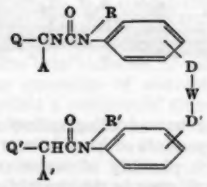
1. A photographic element comprising a support having coated thereon at least one photographic silver halide emulsion layer and in contiguity therewith a yellow dye-forming coupler selected from those having the formulas:

I



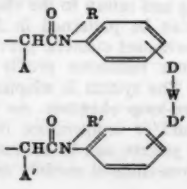
and

II



wherein Q and Q′ each represent a member having from 5 to 32 carbon atoms selected from the class consisting of acyl groups wherein the carbon atom attached to the carbonyl radical of said acyl group is a tertiary carbon atom and the said carbonyl radical is attached directly to the carbon atom of the active methylene in the

moiety of Formula I and the



moiety of Formula II; A and A′ each represents a member selected from the class consisting of the hydrogen atom, a halogen atom and an —SB radical; B represents a member selected from the class consisting of an alkyl radical, an aryl radical and a heterocyclic radical; R and R′ each represent a member selected from the class consisting of the hydrogen atom, an alkyl radical, an aryl radical, and a heterocyclic radical; D and D′ each represent a member selected from the class consisting of the

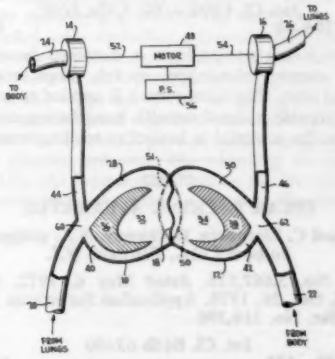
group, the

group, the —$NHSO_2$— group and the —SO_2NH— group; and W represents a bivalent group selected from the class consisting of a phenylene group and an alkylene group.

27,849
DYNAMIC ACTION VALVELESS ARTIFICIAL HEART UTILIZING DUAL FLUID OSCILLATOR

Donald E. Wortman, 609 Muriel St., Rockville, Md. 20852

Original No. 3,599,244, dated Aug. 17, 1971, Ser. No. 878,484, Nov. 20, 1969. Application for reissue Nov. 30, 1971, Ser. No. 203,489
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 12 Claims



An artificial heart intended for supplementing or [temporarily] replacing the natural heart for circulating blood through the body. The heart relies on the dynamic flow properties of the blood for its operation, utilizing a unique dual fluid oscillator with a common diaphragm for providing the pulsing action to a pair of pumps that have pressure-volume flow relationships that simulate the natural heart.

27,850

TWO-WAY PLOW WITH SYNCHRONIZED GUIDED TAIL WHEEL

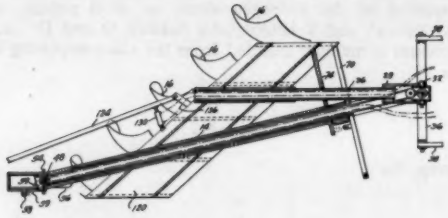
Glen Armon Watts, Rte. 1, Box 258, McMinnville, Oreg. 97127

Original No. 3,507,334, dated Apr. 21, 1970, Ser. No. 616,842, Feb. 17, 1967. Application for reissue Mar. 27, 1972, Ser. No. 238,700

The portion of the term of the patent subsequent to Dec. 2, 1986, has been disclaimed

Int. Cl. A01b *3/28*

U.S. Cl. 172—212 5 Claims



Steerable tail wheel arrangement for two-way plow involving pulleys or the like connected to tractor and mating with reversing pulleys or the like direct-connected to tail wheel to steer tail wheel in direction opposite to change in direction of tractor.

27,851

HARD FACING ALLOY COMPOSITION AND METHOD OF MANUFACTURE

Samuel P. Alessi, Homewood, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Original No. 3,600,201, dated Aug. 17, 1971, Ser. No. 780,204, Nov. 29, 1968. Application for reissue Oct. 12, 1971, Ser. No. 188,509

Int. Cl. C09d *1/00*; C23c *3/00*

U.S. Cl. 106—1 6 Claims

A hard facing composition is disclosed herein which contains carbon, chromium, nickel, silica, manganese boron and iron. The composition is applied to metal surfaces to provide a fused metallic hard facing on the surface when the material is heated to melting temperature.

27,852

SPEAR PACKING APPARATUS

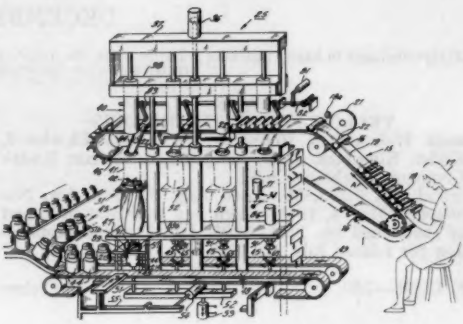
Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Original No. 3,662,518, dated May 6, 1972, Ser. No. 83,868, Oct. 26, 1970. Application for reissue Nov. 29, 1972, Ser. No. 310,390

Int. Cl. B65b *63/00*

U.S. Cl. 53—123 14 Claims

Apparatus for longitudinally segmentizing cucumbers and packing the segments in a jar with the seeded surfaces of the segments facing outward is constructed with means for receiving a whole cucumber and cutting same to predetermined length. The predetermined length of cucumber is slit longitudinally into spears of segmental cross section that are fed through individual twisted chutes and exit therefrom into a jar with the seeded surfaces of the segments facing outward. Guide means at the exit ends of the twisted chutes directs the segments outward toward the jar wall. Thereafter the guide means and the jar are angularly stepped so that additional spear segments entering the jar are directed between those segments previously placed in the jar.



27,853

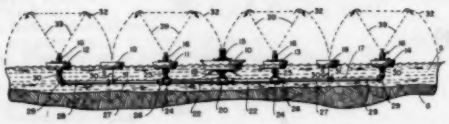
MODULAR FLOATING WATER-COOLING SYSTEM

Paul A. Frohwerk, Fort Worth, Tex., assignor to Ceramic Cooling Tower Company, Fort Worth, Tex.

Original No. 3,622,074, dated Nov. 23, 1971, Ser. No. 39,351, May 21, 1970, which is a continuation-in-part of Ser. No. 7,901, Feb. 2, 1970. Application for reissue Feb. 23, 1972, Ser. No. 228,664

Int. Cl. B05b *17/08*

U.S. Cl. 239—11 37 Claims



An evaporative water-cooling system and method for reducing the temperature of heated water in an open flow channel utilizes a plurality of water pump and spray units or modules floating in the channel and anchored at sequential locations therealong. In a preferred embodiment, the modules are identical in design, and each include at least three separate floats, a power-operated water pump supported by one of the floats, at least two sprays supported by others of the floats, and pipes connecting the pump to the sprays. Within each module, the floats are preferably aligned in the direction of flow, the pump float being centered with spray floats upstream and downstream, and the pump intake being located beneath and protected by the overhang of its disk-shaped float. The sprays project water upwardly into the atmosphere for evaporative cooling and return to the channel. The standardized modules can be patterned in flow-direction sequences and cross-channel clusters, providing a predeterminable temperature reduction profile under specified design conditions. The system is adapted for both once-through and closed-loop channels. As water flow rate, channel volume and/or temperature reduction requirements change, the pattern can be altered accordingly, by either down or cross-channel module modifications.

27,854

INSULATED TELEPHONE CABLE

Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Original No. 3,515,796, dated June 2, 1970, Ser. No. 814,200, Apr. 7, 1969, which is a continuation-in-part of Ser. No. 779,376, Nov. 27, 1968, which in turn is a continuation-in-part of Ser. No. 730,933, May 21, 1968, both now abandoned. Application for reissue Oct. 12, 1972, Ser. No. 296,940

The portion of the term of the patent subsequent to May 19, 1987, has been disclaimed

Int. Cl. H01b *11/00*

U.S. Cl. 174—113 R 12 Claims

An insulated telephone cable is prepared from individually insulated conductors which are gathered together and insulated as a unit. The individually insulated conductors are prepared from aluminum alloy wires having an acceptable electrical conductivity of at least sixty-one percent based on the International Annealed Copper Standard and an increased tensile strength when compared to conventional aluminum alloy wire of the same percent ultimate elongation. In addition, the present wire has an increased percent ultimate elongation when compared to conventional wire of the same tensile strength. The aluminum alloy wires contain substantially evenly distributed iron aluminate inclusions in a concentration produced by the addition of more than about 0.30 weight percent iron and no more than 0.15 weight percent silicon to an alloy mass containing less than about 99.70 weight percent aluminum and trace quantities of conventional impurities normally found within a commercial aluminum alloy. The substantially evenly distributed iron aluminate inclusions are obtained by continuously casting an alloy consisting essentially of less than about 99.70 weight percent aluminum, more than 0.30 weight percent iron, no more than 0.15 weight percent silicon and trace quantities of typical impurities to form a continuous aluminum alloy bar, hot-working the bar substantially immediately after casting in substantially that condition in which the bar is cast to form continuous rod which is subsequently drawn into wire without intermediate anneals, annealed after the final draw and insulated. After annealing and insulating, the individual wires are brought together and insulated with an outer sheath. The telephone cable generally consists of two or more individually insulated wires brought together in a conventional stranding operation.

27,855

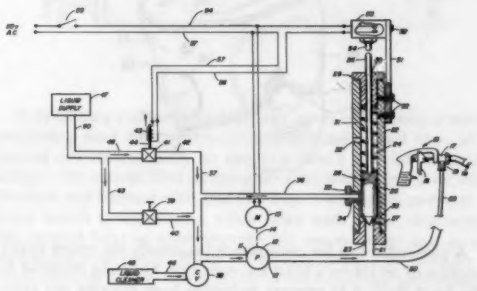
CLEANING APPARATUS WITH RELIEF CONTROL VALVE

Iven R. Norstrud and John H. Threlkeld, Britt, Iowa, assignors to Britt Tech Corporation, Britt, Iowa

Original No. 3,140,049, dated July 7, 1964, Ser. No. 240,629, Nov. 28, 1962. Application for reissue July 1, 1966, Ser. No. 572,164

Int. Cl. B05b *7/04, 9/00*

U.S. Cl. 239—126 18 Claims



The present disclosure is directed to pressure washing apparatus used primarily in washing vehicles. The pressure washer uses a high-pressure pump to deliver a cleaning solution to the surface to be cleaned at approximately 500 p.s.i. through a flow-directing device or gun. The choice of at least two cleaning fluids is controlled through the use of a solenoid operated valve and a check valve. The solenoid-operated valve is controlled by the changes in fluid-line pressure between the pump and the gun due to opening and closing the valve in the gun. A pressure relief valve including a pressure-actuated switching mechanism is connected to the fluid line between the pump and the gun and responds to the pressure changes in the line. An electrical circuit including the switching mechanism and solenoid-operated valve alternately opens and closes the solenoid-operated valve to change the source of cleaning solution. The switching mechanism is controlled by the pressure changes in the line created by opening and closing the valve in the flow-directing device or gun.

PATENTS

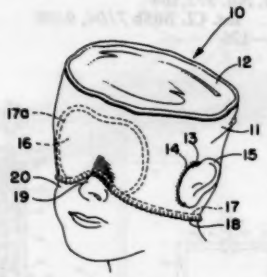
GRANTED DECEMBER 25, 1973

GENERAL AND MECHANICAL

3,780,379
PROTECTIVE CAP FOR INFANTS

Joy M. Kampman, North Olmsted, Ohio, assignor to Joyco, Inc., Cleveland, Ohio

Filed Dec. 14, 1972, Ser. No. 315,151
Int. Cl. A61f 9/00
U.S. Cl. 2—15 15 Claims

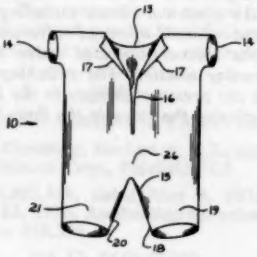


A protective cap for enclosing substantially the entire upper portion of an infant's head has radiation blocking material in the front thereof to prevent radiation from injuring the eyes. The top of the cap and ear openings in the sides of the cap cooperate to facilitate application while effectively retaining the cap in proper position on the head, and resilient material in a hem portion of the cap provides for snug fitting against the face without restricting circulation.

3,780,380
DISPOSABLE PROTECTIVE LINER

Amy W. Lafollette, Rt. 3, Red Oak, Iowa

Filed July 20, 1972, Ser. No. 273,491
Int. Cl. A41b 9/00
U.S. Cl. 2—78 R 5 Claims

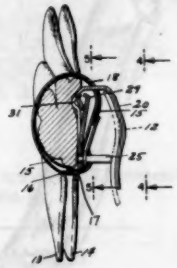


A thin flexible protective liner for use as a disposable undergarment to protect outer garments from the transmission of soilage and disease, comprising a trunk section and leg sections formed to enclose the human body from above the knees to the neck wherein donning and removal of the liner is accomplished through a front slit in the trunk. The protective liner may further include a reinforcing panel in the groin area thereof.

3,780,381
BOW TIES

John Najarian, Cresskill, N.J., assignor to France Neckwear Co. Inc., New York, N.Y.

Filed Jan. 4, 1973, Ser. No. 320,976
Int. Cl. A41d 25/08
U.S. Cl. 2—154 6 Claims

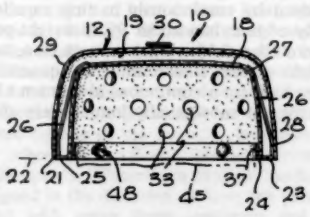


A pre-formed bow tie comprises the usual bow shaped elements which are interconnected at their constricted, reduced width, centers, by a locking band wrapped thereabout. The band is covered by fabric. The band also includes a spring controlled vertically swingable lever arm by means of which the pre-formed bow tie may be releasably secured to the neckband of a shirt without being connected to the collar of the shirt. The neckband may be that of a turtle neck shirt as well as the conventional collared shirt.

3,780,382
HAT OR CAP CONSTRUCTED FOR AIR CIRCULATION THERETHROUGH

Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif.

Filed Aug. 2, 1971, Ser. No. 168,018
Int. Cl. A42b 1/00
U.S. Cl. 2—182.6 9 Claims

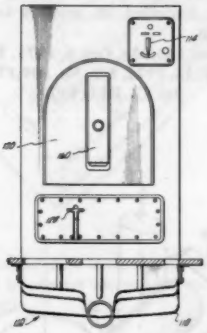


A hat or cap having an outer crown structure containing a number of spaced apertures, and an inner element or elements located opposite the apertures in a relation shielding the user's head from the sun's rays while at the same time allowing free circulation of air into the interior of the hat or cap and to the user's head. Additional freedom for circulation is provided by supporting the hat or cap on the head at only a few circularly spaced locations, to allow movement of air upwardly into the hat or cap between those locations.

3,780,383
RETRACTABLE RECIRCULATING TOILET SYSTEM MODULE

William F. Katona, Northridge, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 43,450, June 4, 1970, Pat. No. 3,593,346.
This application Apr. 22, 1971, Ser. No. 136,473
Int. Cl. E03d *11/12, 11/10*
U.S. Cl. 4—10 4 Claims



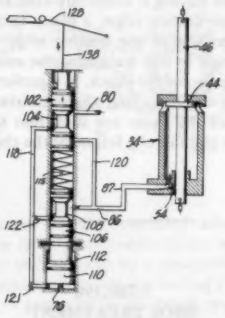
A novel toilet system is disclosed which is alternatively operable on a recirculating fluid supply or an external water supply.

In a specific embodiment, the toilet retracts into a wall fixture and combines a movable bowl member with a fixed receiver member. Separate flush lines clean the bowl and the receiver when in the retracted configuration.

3,780,384
AUTOMATIC TOILET FLUSHING SYSTEM

George R. Rivelle, 1123 Venton St., San Dimas, Calif.

Filed Jan. 17, 1972, Ser. No. 218,216
Int. Cl. E03d *1/36, 5/04*
U.S. Cl. 4—41 19 Claims

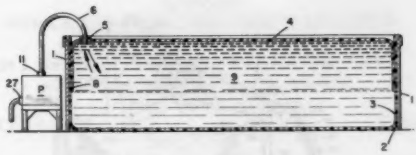


An automatic flushing system for a toilet having a bowl mounting a hinged seat and a flush tank containing a flush valve which is raised from closed position to open position to flush the toilet and returns to closed position at the end of the flush cycle. The flushing system has a water pressure actuated flush valve operator to be mounted in the toilet flush tank and operatively connected to the flush valve, and seat actuated valve means for providing a regulated flow of water to the operator for opening the flush valve and then releasing the valve for closure in response to application of a downward to and removal of the force from the toilet seat. The toilet may also be flushed by hand, if desired.

3,780,385
SWIMMING POOL COVER

Robert R. Dunn, 105 Seneca Dr., Brightwaters, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,934
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 7 Claims

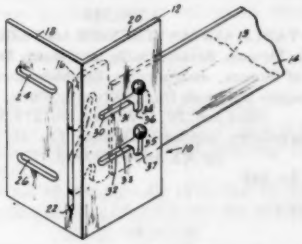


A swimming pool unitary liner and cover comprising a first swimming pool liner and a second swimming pool liner attached circumferentially to the first liner's interior vertical surface, the second liner defining the pool bottom in a lowered position and forming with said first liner a watertight compartment which compartment, when filled with water, displaces the second liner upward whereby the second liner acts as a swimming pool cover. Water is introduced into the compartment through a hose fitting in one of the liners, and preferably the second liner. The water which is introduced into the compartment may optionally be the swimming pool water which is located upward of the second liner.

3,780,386
MECHANICAL FASTENER FOR FRAME OF BED

Philip F. Fouks, and Donald H. Wriggins, both of 114 South Blvd., Evanston, Ill.

Filed May 4, 1971, Ser. No. 140,149
Int. Cl. A47c *19/00*; A47f *5/00*
U.S. Cl. 5—296 12 Claims



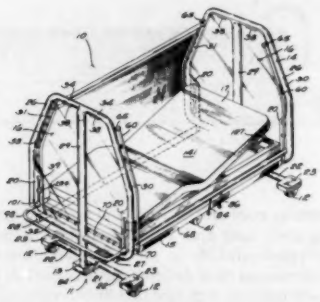
A great flexibility of use and reduction of inventory are made possible by the convertible bed rail connector means of the invention which allows connection of a bed rail means to a bed post means alternately by hook means or bolted means while at th same time allowing the bed rail means to either support the bed post means as would be the case in a "Hollywood" bed arrangement or will allow the bed rail means to be supported by the bed post means as is the case in a conventional bed stead arrangement. An angular bracket member is movably coupled to a bed rail means so that hook means on the bed rail means may pass through a slot in the bracket to effect hook coupling means and to be retracted to a position

where the bracket may be connected to the bed post means for either supporting the bed rail means or being supported by the bed rail means.

3,780,387
PEDIATRIC BED

Robert L. Propst, Ann Arbor, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Division of Ser. No. 175,505, Aug. 27, 1971. This application Sept. 27, 1972, Ser. No. 292,808
Int. Cl. A47c *27/08*
U.S. Cl. 5—345 **8 Claims**



A bed platform is suspended within a support frame having transparent and removable plastic end walls and plastic mesh sides slidable on a Tambour track between raised and lowered positions. As the sides are raised, they slope inwardly over and above the platform to discourage climbing. The support frame is mounted on a caster supported base having upstanding end posts attached to the frame and adjustable height-wise by a motor driven lift. The platform is supported on the ends of the frame and is adjustable for Trendelenburg and reversed Trendelenburg positioning. Affixed to the platform is a mattress frame which includes adjustable and pivotal portions for Gatch positioning. The mattress is molded with a shell-like configuration to fit over the mattress and support frame and includes living hinges to permit folding into various Gatch positions. It also includes grippers along its underside for positive grip sheet placement.

3,780,388
INFLATABLE AIR MATTRESSES AND LIKE ARTICLES

Andre G. Thomas, Briant-Amilly, and Basile Fetissoff, Pannes, both of France, assignors to Etabbissements Hutchinson Compagnie Nationale Du Caoutchouc, Paris, France

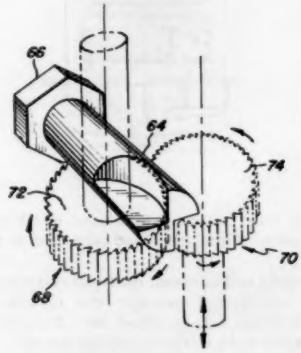
Filed Jan. 20, 1972, Ser. No. 219,329
Claims priority, application France, Jan. 22, 1971, 7102222
Int. Cl. A47c *27/08, 27/18*
U.S. Cl. 5—349 **8 Claims**

An air mattress has an upper and a lower member joined together at edge portions to form a lip. The width of the lower member is greater than that of the lower member so that the lip lies, when the mattress is inflated at the level of the upper member.

3,780,389
METHOD OF MANUFACTURING A SELF-DRILLING AND SELF-TAPPING FASTENER

Bert A. Lindstrom, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Division of Ser. No. 186,928, Oct. 6, 1971. This application Nov. 24, 1972, Ser. No. 309,176
Int. Cl. B23g *9/00*
U.S. Cl. 10—10 R **6 Claims**



This improved non-walking, non-skittering self-drilling and self-tapping screw fastener is manufactured by a simplified, versatile method comprising pointing and fluting steps involving axial movement of end mill cutters. The resulting threaded fastener features a pair of oppositely-disposed, substantially-longitudinally-extending milled flutes at the entering end, each of the flutes having a uniformly-concavely-curved flute side including the cutting edge, a plane tangent to the concavely-curved surface at the cutting edge extremity being inclined at an angle to and traversing the axis of the screw at an intermediate point of the shank. In a preferred embodiment having enhanced chip-breaking characteristics, the curvature and disposition of the flutes are such that they redirect the normal chip flow and thereby fragment the chips by flexure.

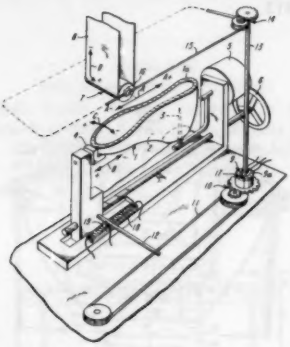
3,780,390
SHOE TREATMENT

Dieter Braun, Stuttgart, Germany, assignor to Fortuna-Werke Maschinenfabrik Aktiengesellschaft, Stuttgart, Germany

Filed Aug. 29, 1972, Ser. No. 284,579
Int. Cl. A43d
U.S. Cl. 12—1 R **41 Claims**

A shoe treatment machine in which a tool is provided which operates on the edge of the sole portion which is turned over the top of a last. The tool moves longitudinally of the last and which last pivots about a longitudinal axis so that the tool operates on the upper material near the periphery of the sole

portion of the last. A control arrangement is provided operated by potentiometers which are adjustable in conformity with the size of the shoe last and with the longitudinal position of the tool to control the pivotal movement of the last during a work cycle.



3,780,391

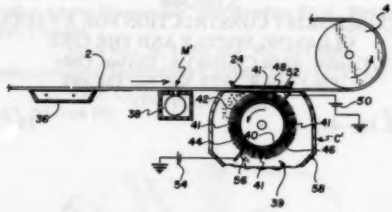
APPARATUS FOR CLEANING A RESIDUAL IMAGE FROM A PHOTOSENSITIVE MEMBER

Donald D. Leenhouts, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 88,628, Nov. 12, 1970, abandoned. This application June 9, 1972, Ser. No. 261,478

Int. Cl. G03g *15/00*

U.S. Cl. 15—1.5 **9 Claims**



A residual toner image remaining after transfer of a developed image from a photoconductive surface is cleaned therefrom in one embodiment by a conductive cleaning brush mounted in a vacuum chamber and having a flicker bar which is used to apply a potential to the brush opposite that of the residual toner particles to be removed from the photoconductive surface. In another embodiment, the brush is divided into a number of electrically insulated segments so that the polarity of the potential applied to a portion of the brush coming in contact with the photosensitive surface is opposite to the charge on the residual toner particles and a potential applied to a segment spaced from the photoconductive surface is the same as the charge on the toner particles on the brush segment so that they are repelled therefrom to clean the toner particles from the brush.

3,780,392

MICRO-ORGANISM CONTROL COMPOSITION AND DUST CLOTH THEREWITH

David Lester, Cambridge, Mass., assignor to Quatek, Inc., Waltham, Mass.

Filed July 9, 1971, Ser. No. 161,291

Int. Cl. A47l *13/17*; **C11d** *17/04*

U.S. Cl. 15—104.93 **2 Claims**

A dust cloth comprises a tacky vinyl adhesive that causes dust retrieval and retention, a low molecular weight polyalcohol lubricant for masking the adhesive in order to enable slip, and a bio-active material for micro-organisms retrieved and retained.

3,780,393

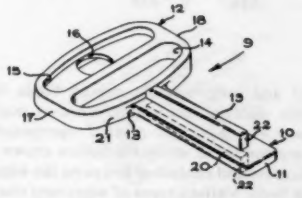
DEVICE FOR DIRECTING FOOD WASTE INTO GARBAGE DISPOSAL INLET

Hubert J. Gaetke, 6630 Dartmoor Way, San Jose, Calif.

Filed June 16, 1972, Ser. No. 263,475

Int. Cl. A47l *17/06*

U.S. Cl. 15—105 **7 Claims**



A device for safely directing food waste through a flexible cover guard and into the inlet of a garbage disposal unit. The device comprises a pusher-scraper blade. Integrally formed at the end of the pusher-scraper blade is a hand grip. Auxiliary pusher blades are formed along the sides of the pusher-scraper blade and extend partially therealong at right angles thereto. The auxiliary pusher blades extend lengthwise along the pusher-scraper blade from the vicinity of the hand grip to a point removed from the free end of the pushing-scraping blade. The auxiliary blades serve to facilitate the opening of the flexible cover guard so that food waste passes from a sink into the inlet of a garbage disposal unit. The hand grip is sufficiently large so that it cannot advance beyond the cover guard and pass into the garbage disposal unit. The pusher-scraper blade is sufficiently short so that even when inserted fully through the cover guard, it will not contact the moving parts of the garbage disposal unit.

3,780,394

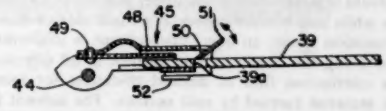
WINDSHIELD WIPER ASSEMBLY

William J. Quinlan, and Lawrence L. Huver, both of Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.

Division of Ser. No. 90,987, Nov. 19, 1970, Pat. No. 3,717,900. This application June 29, 1972, Ser. No. 267,620

Int. Cl. B60s *1/40*

U.S. Cl. 15—250.32 **1 Claim**



An elongated and longitudinally curved blade body of resiliently flexible material has a hollow crown portion in-

tegral with a lower wiping portion. A set of superposed metallic leaf springs are contained within the hollow crown portion for proper application and control of forces on the wiping portion of the blade body. Various types of wiper arm connectors may be secured to the blade body by fasteners which engage the leaf springs in the crown portion.

3,780,395

WINDSHIELD WIPER ASSEMBLY

William J. Quinlan, and Lawrence L. Huver, both of Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.

Division of Ser. No. 267,620, June 20, 1972 which is a division of Ser. No. 90,987, Nov. 19, 1970, Pat. No. 3,717,900. This application Nov. 29, 1972, Ser. No. 310,447

Int. Cl. B60s 1/38

U.S. Cl. 15—250.36 **3 Claims**

An elongated and longitudinally curved blade body of resiliently flexible material has a hollow crown portion integral with a lower wiping portion. A set of superposed metallic leaf springs are contained within the hollow crown portion for proper application and control of forces on the wiping portion of the blade body. Various types of wiper arm connectors may be secured to the blade body by fasteners which engage the leaf springs in the crown portion

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3,780,396

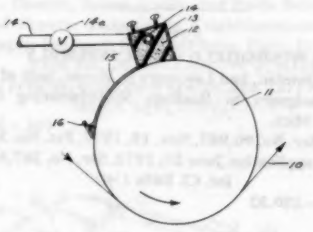
ROLL CLEANING APPARATUS FOR PAPERMAKING MACHINES AND THE LIKE

Charles E. Werner, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 29, 1970, Ser. No. 32,855

Int. Cl. D21g 3/02, 3/04

U.S. Cl. 15—256.51 **4 Claims**



A solvent is metered onto the upper portion of a cylindrical surface while said surface moves at a rapid rate of speed due to its rotation about an axis. The solvent is uniformly distributed along the extent of said surface in all directions to form a continuous film of desired thickness for loosening foreign material carried by said surface. The solvent film is maintained on the moving surface through a segmental arc and is then separated from said surface together with the then loosened foreign material.

3,780,397

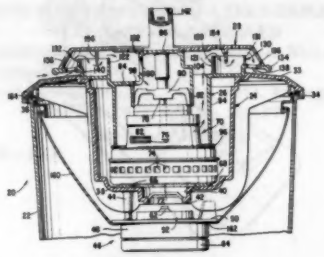
WET/DRY SUCTION CLEANER

Martin E. Harbeck, and Robert C. Lagerstrom, both of Anderson, S.C., assignors to The Singer Company, New York, N.Y.

Filed Jan. 3, 1973, Ser. No. 320,803

Int. Cl. A47l 5/00, 7/00

U.S. Cl. 15—413 **3 Claims**



A wet/dry suction cleaner having a dirt storage receptacle and a power suction module mounted thereon. The module includes a lower housing, a separator housing and a top cover. A by-pass motor-blower unit is mounted between the two housings and an air shut-off valve assembly depends downwardly from the lower housing into the receptacle. The separator housing includes downwardly depending annular walls which separate the blower working airflow from the motor cooling airflow and has an exhaust port which communicates with the blower airstream. Motor cooling air enters inlet slots in the separator housing and is baffled by a labyrinth of vertical walls formed by the top cover and separator housing. The air then flows between the top and the separator floor and enters the motor through an opening in the separator. The cooling air exits the motor to a cooling air exhaust chamber formed by the annular walls of the separator housing, exhausts therefrom between the cover and separator housings, and is baffled before exiting by a labyrinth similar to that at its entry.

3,780,398

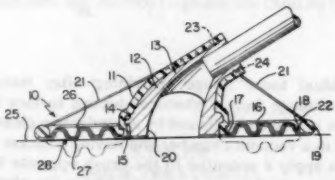
FLEXIBLE SKIRT CONSTRUCTION FOR A VACUUM CLEANING NOZZLE AND THE LIKE

James T. Candor, 5440 Cynthia Ln., Dayton, Ohio

Filed Feb. 8, 1972, Ser. No. 224,484

Int. Cl. A47l 9/02

U.S. Cl. 15—415 **16 Claims**



In combination with a nozzle construction for a vacuum cleaning operation, a separate member having a body portion detachably secured to the nozzle construction and having a flexible wall surrounding the inlet of the nozzle construction and outboard of the same to have one side thereof engage against a surface means around the inlet to substantially seal the inlet of the nozzle construction to the surface means. The flexible wall is so constructed and arranged that a pressure dif-

ferential acting across the same and resulting from a vacuum pump drawing fluid from the surface means into the inlet of the nozzle construction is adapted to cause the flexible wall to be urged toward the surface means to substantially seal against the same around the inlet and substantially conform to the contour of the surface means outboard of the nozzle construction.

3,780,399

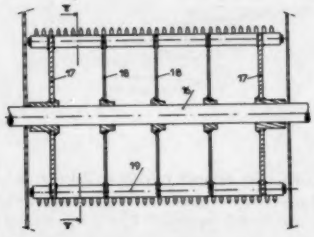
FIBER OPENING MACHINE

Andre Morel, Cours, France, assignor to Constructions Mecaniques F. Laroche & Fils, Cours (Rhone), France

Filed Feb. 10, 1972, Ser. No. 225,167

Int. Cl. D01b *1/00*; D01g *19/00*

U.S. Cl. 19—97 **4 Claims**



The textile fiber-opening machine is provided with a feed roller having a plurality of pivoted pressure members individually spring biased toward the periphery thereof to assist in the feeding of the material of varying thickness therebetween. A breaking cylinder is also provided having a plurality of axially directed peripheral grooves. An assembly of toothed members are fastened together end-to-end. Such an assembly is inserted and retained in each of the grooves with the teeth projecting outwardly from the grooves to engage the material being fed by the feed roller.

3,780,400

FASTENER FOR FLEXIBLE SHEET MATERIAL

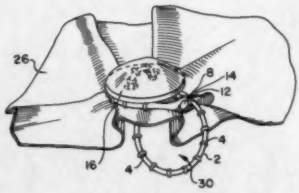
Cornelius Andre Hinsperger, 360 Rexdale Blvd., Rexdale, Ontario, Canada

Filed Nov. 9, 1972, Ser. No. 305,009

Claims priority, application Canada, Sept. 11, 1972, 151400

Int. Cl. A44b *21/00*; B65d *63/00*

U.S. Cl. 24—16 PB **9 Claims**



A fastener for flexible sheet material, such as cloth, plastic sheeting, tarpaulins, and the like is disclosed. The fastener consists of an elongate cord member having enlarged or bulbous portions provided at spaced distances therealong, with one end of the cord having a flattened tab portion and an aperture thereon to receive the other end of the cord member which passes therethrough to form a loop portion. The said other end of the cord is then attached to a button member. In use, the button is positioned on one side of a sheet of material and the loop portion passed over the button from the other side of the sheet carrying a portion of the sheet material therewith. The tab is then moved along the cord to close the loop to a diameter smaller than the button and securely hold the fastener to the sheet material. The aperture in the tab portion is provided with a contiguous slot opening in which the cord is fitted after the loop is tightened. The slot is of a width to receive the cord but the width is less than the diameter of the enlarged portions to prevent longitudinal movement of the cord with respect to the slot. The fastener may be used with any flexible sheet material and is re-usable any number of times without damage to the sheet material.

3,780,401

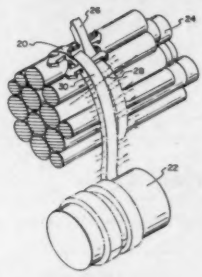
FASTENING DEVICE

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Nov. 13, 1972, Ser. No. 305,766

Int. Cl. B65d *63/00*

U.S. Cl. 24—16 PB **5 Claims**



A locking strap fastening device comprising an elongate strap body of a selected dimension and having a plurality of locking fingers extending outwardly from opposed sides thereof, adjacent locking fingers being tapered and spaced apart from one another by a distance no greater than the dimension of the strap body such that in a flexible embodiment the fingers at one portion of the strap may be locked about the strap body at another portion of the strap such as to encircle and retain articles to be bound together. Alternatively the invention may be used in a rigid form as a fastener.

3,780,402

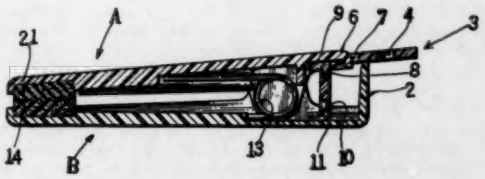
PLASTIC CLIP

Teruo Takabayashi, Kyoto, Japan, assignor to Korin Limited, Kyoto City, Japan

Filed July 31, 1972, Ser. No. 276,593

Int. Cl. A44b *21/00*

U.S. Cl. 24—250 HE **8 Claims**



The present invention relates to a plastic clip comprising at least first and second clip members adapted to open and close

freely by means of a spring member, one of said clip members having a pair of journals and the other clip member having a pair of bearings each of which includes a bearing portion each of the journals being fitted into each of the bearing portions.

3,780,403

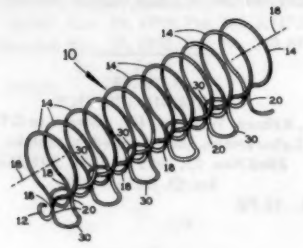
SPRING CLIP

Frank A. Mauritz, 2760 S.W. 1st St., Ft. Lauderdale, Fla.

Filed Aug. 13, 1971, Ser. No. 171,516

Int. Cl. A44b *21/00*

U.S. Cl. 24—261 D **3 Claims**



A spring clip comprising a spring wire wound generally circularly back and forth about an axis to form a series of parallel loops having the same axis. The loops are joined together at mouths thereof by interconnection portions of the wire which alternate between left and right sides of the loops. The loops have shank portions at the mouths thereof which, when spread, squeeze together due to the spring action of the loops. Thus, the loops can be slipped onto the rim of a container such as a trash can to hold the mouth of a bag on the rim.

3,780,404

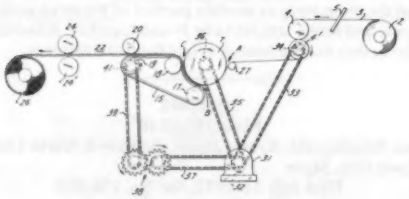
PROCESS AND APPARATUS FOR TEXTURIZING YARN

Charles P. Mazzone, 16 Pine St., Dover, N.J.

Continuation-in-part of Ser. No. 266,184, June 26, 1972, abandoned. This application Oct. 13, 1972, Ser. No. 297,566

Int. Cl. D02g *1/20*

U.S. Cl. 28—1.3 **10 Claims**



Multiple ends of continuous multifilament yarns are texturized within a pressure applying zone formed by confronting surfaces of a moving belt and a rotating heated roll with said confronting surfaces moving in the same direction. The yarns are arranged in spaced side-by-side relationship and fed at a speed greater than that of the moving belt into contact with the heated roll at a point upstream from the pressure applying zone, the peripheral speed of the heated roll being at least 1.4 times that of the moving belt. The filaments of the yarns are differentially shrunk and then carried into the pressure applying zone, i.e., between the rotating roll and the moving belt. The surface of the moving belt has a greater gripping power on the multifilament yarns than the heated roll surface, whereby the speed of the multifilament yarns is reduced upon contact with the belt and the filaments of the yarns are forced into a folded configuration in which they are then heat set.

3,780,405

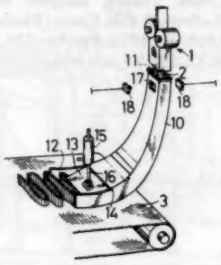
APPARATUS FOR SUPPLYING CRIMPED SYNTHETIC FILAMENT TOW TO CONVEYOR FOR HEAT TREATMENT

Nobuharu Izawa; Hiroshi Toyoshima, and Koh Ikazaki, all of Matsuyama, Japan, assignors to Teijin Limited, Tokyo, Japan

Filed May 17, 1972, Ser. No. 254,220

Int. Cl. D02g *1/12*

U.S. Cl. 28—1.6 **10 Claims**



An apparatus for supplying crimped synthetic filament tow to a conveyer for heat treatment is installed between a crimping device and the conveyor. The apparatus comprises a supply chute having a vertical portion in which crimped tow intermittently forced out from the crimping device is piled up, a curved portion, the lower end of which is formed to set up said crimped tow at right angles with respect to conveyer surface, and an outlet portion through which said crimped tow is forced out by pressure of succeeding tow. Flapper means is pivotably attached to said outlet portion of said supply chute to control filling conditions of said tow within said supply chute. A supplemental chute member may be provided between the crimping device and the supply chute, said supplemental chute member having a flapper pivotably attached thereto to control the discharge of the crimped tow from the supplemental chute.

3,780,406

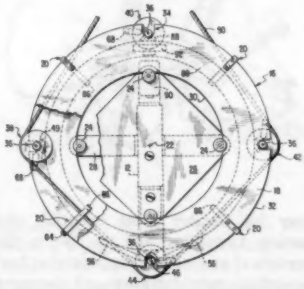
MACHINING CENTER EMPLOYING CAM OPERATED TOOL CHANGER

John A. Cupler, II, 10 Cupler Dr., Cumberland, and Wayne B. Stone, Jr., Bethesda, both of Md., assignors to said Cupler, by said Stone

Filed Jan. 26, 1971, Ser. No. 109,852

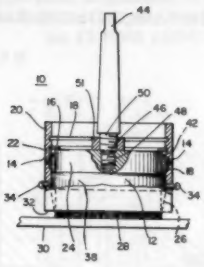
Int. Cl. B23q *3/157*

U.S. Cl. 29—26 A **17 Claims**



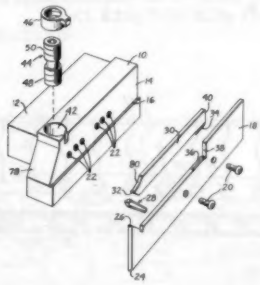
A machining center wherein rotating tools are cammingly interchanged between a tool carrier and tool bearing as a direct function of tool carrier movement.

3,780,407
METAL WORKING BRUSH ASSEMBLY
James L. Hoffecker, 4112 Vernon Rd., Drexel Hill, Pa.
Filed Dec. 2, 1971, Ser. No. 204,201
Int. Cl. B21c *43/00*
U.S. Cl. 29—90 **8 Claims**



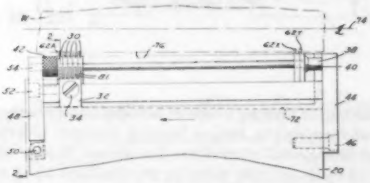
A brush having a circular array of wire strands located within a central opening of a control collar with the tips of the wire strands protruding from one extremity of the collar. The central opening of the collar adjacent this extremity is formed by an inwardly tapering surface of revolution having a minimum inside diameter at the collar extremity. The brush is locked within the collar by a spring retaining ring which is captured by one of a plurality of axially displaced annular grooves located within the central opening of the collar. Set screws extending through the collar and into contact with the ferrule of the brush are also utilized to lock the brush in place. A concentric ring which encircles the ferrule maintains the collar and the brush in coaxial relationship.

3,780,408
CUTTING TOOL
James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Mar. 2, 1972, Ser. No. 231,199
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **9 Claims**



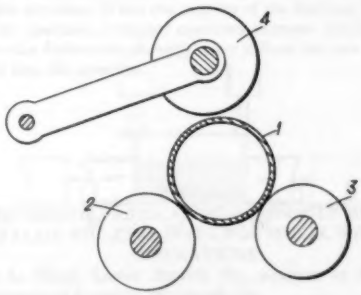
A cutting tool in which a small rod-like piece of cemented carbide material is mounted at an angle so that one end projects from the holder and on which one end is a cutting edge for being presented to work to be turned. The holder consists of a block adapted for mounting in a holder in a machine tool and on one side of the block is a support plate having an inclined insert supporting surface at one end on which the rod-like cutting insert rests. A clamp plate overlies the support plate and a clamp presses the clamp plate down so that a surface thereon engaging the insert from above will clamp the insert against the support plate. The insert in the lateral direction has a greater dimension than the corresponding dimension of the support and clamp plates and thereby takes a kerf from the work which has clearance on both sides from the support and clamp plates whereby the tool is useful, amongst other things, for cut off operations.

3,780,409
THREADING TOOL
Joseph G. Bartoszevicz; George H. Murphy, Jr., and Frederick W. Schmidt, all of Plantsville, Conn., assignors to Fansteel Inc., North Chicago, Ill.
Filed Feb. 19, 1971, Ser. No. 116,912
Int. Cl. B26d *1/00*
U.S. Cl. 29—97 **6 Claims**



A threading tool for providing a simultaneous cut in a plurality of adjacent grooves of a thread to enable a progressive cut to be taken with the light cut in each groove permitting a full thread depth to be cut with one pass along a turning cylindrical workpiece. The invention includes a means for presenting an array of cutting inserts at the proper angle to provide for the proper cut, at the same time setting up a proper plunge clearance for the cutting teeth with an independent pressure locator on each tooth in the form of an interdigital clamp designed to exclude the collection of chips and dust.

3,780,410
SHAPING OF HOLLOW METAL ARTICLES
Noel Francis Drake, Flat 3, 4 The Point Rd., Woolwich, New South Wales, Australia
Filed June 1, 1972, Ser. No. 258,703
Int. Cl. B21d *13/04*
U.S. Cl. 29—155 R **6 Claims**



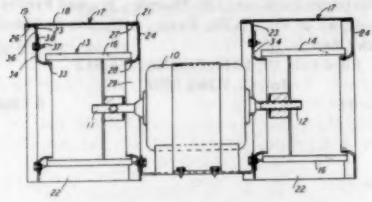
Metal tubes are shaped, particularly for use as guard rail stanchions, by heating the tube in a series of bands, in order to render the tube malleable in such heated regions, and passing the heated tube between a set of rollers, one of which is shaped with a series of alternating troughs and crests whereby the crested portions act on the metal bands of the heated tube.

3,780,411

METHOD OF MAKING BLOWER HOUSING ASSEMBLY

Shelly A. Bulin, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 19, 1972, Ser. No. 299,054
Int. Cl. B23p *15/00, 17/00*
U.S. Cl. 29—156.4 R 5 Claims



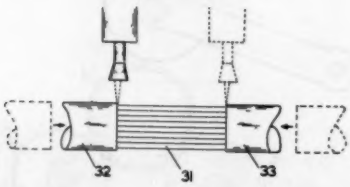
A method of making a blower housing assembly through the steps of forming the blower housing wrapper to extend in a curved shape and to enclose the blower blades which are powered by an electric motor or the like. Left-hand and right-hand end plates or heads are formed and attached to the wrapper to enclose the housing for directing the air therethrough. The heads are made from die sets which form an inner flange and an outer flange on each head and these flanges are facing in the same direction. The inner flange is cut away on one of the heads, is reversed thereon, and is reattached to that head so that the two end heads now have the inner flange facing toward each other. Therefore, only two dies are required to make the left-hand and the right-hand heads, as mentioned, rather than several or even five or more die sets.

3,780,412

METHOD OF PRODUCING CYLINDRICAL COMPONENTS

Barry John Millard, Earley, near Reading, England, assignor to Adwest Engineering Limited, Berkshire, England

Filed Nov. 16, 1970, Ser. No. 89,666
Claims priority, application Great Britain, Nov. 28, 1969, 58,423/69
Int. Cl. B21d *53/10;* B23p *15/14*
U.S. Cl. 29—157.1 R 9 Claims



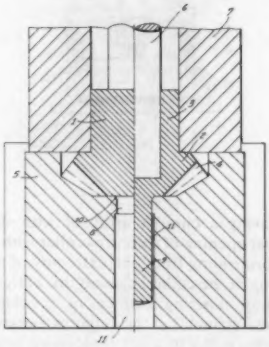
A method of producing cylindrical components, particularly cylindrical components for rotary valves or pinion members, the method comprising initially producing the component in two or more separate parts, preferably heat-treating the separately formed parts, assembling said parts and electron beam welding or friction welding the parts together to form the complete component.

3,780,413

METHOD FOR MAKING HOLLOW BEVEL GEARS WITH INTEGRAL HOLLOW SHAFT

Marten Burgdorf, Ruckersdorf, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Aug. 24, 1972, Ser. No. 283,520
Claims priority, application Germany, Sept. 2, 1971, P 21 44 006.2
Int. Cl. B21d *53/28;* B21h *5/00;* B21k *1/30*
U.S. Cl. 29—159.2 3 Claims



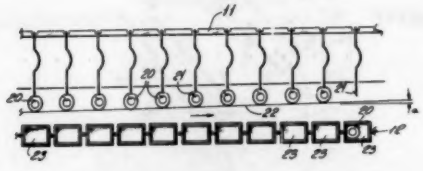
A solid bevel gear with integral solid shaft is provided as a blank and a core is extruded from this blank by means of an extrusion punch acting through the shaft end of the blank, using a die that supports the bevel gear in contour fitting relation as to the teeth and having a bore of diameter smaller than the punch through which the core is extruded. The core is subsequently removed.

3,780,414

AUTOMATED CONVEYOR SYSTEM

Richard Skaggs, Columbus, Miss., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 5, 1972, Ser. No. 241,370
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 A 5 Claims



An automated conveyor system, in which the product is carried by one continuous conveyor, and the machinery for processing the product is carried by additional continuous conveyors. A segment of each machinery conveyor parallels and is directly above a segment of the product conveyor, with the direction of rotation of each continuous product conveyor being opposite to the direction of rotation of the continuous machinery conveyor. The speeds of all conveyors are so adjusted that at those locations where a machinery conveyor is parallel to, and above the product conveyor, both conveyors

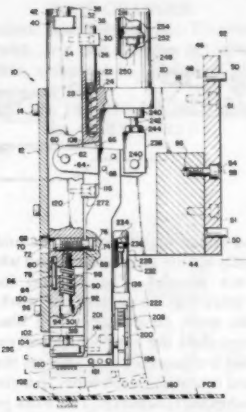
are aligned together, move at the same speed and in the same direction, so that machinery can perform machining functions on the product being carried by the product conveyor.

3,780,415

DUAL IN-LINE SOCKET INSERTION APPARATUS

Phillip A. Ragard, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Mar. 20, 1972, Ser. No. 236,261
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **10 Claims**



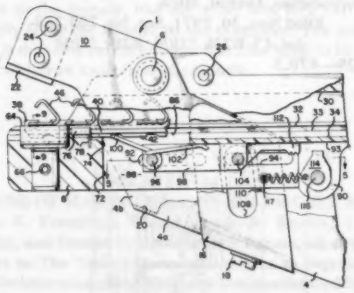
An apparatus for aligning the leads of dual in-line sockets and inserting them into a printed circuit board featuring a rotatable grooved lead aligner which acts on leads depending from a pair of biased latches and then swings away to allow a driver having a biased insertion head to move vertically downward, engage the latches to swing them apart and force the component into the printed circuit board.

3,780,416

SURGICAL TUBING CLIP CLENCHING TOOL

George William Rider, 172 Eddington Ave., Harrisburg, Pa.

Continuation of Ser. No. 67,172, Aug. 26, 1970, abandoned. This application July 10, 1972, Ser. No. 270,401
Int. Cl. B23q *7/10*; B23p *11/00*
U.S. Cl. 29—212 D **1 Claim**



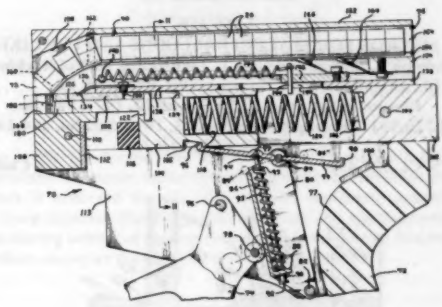
A hand operated tool having means for storing a carrier strip provided with a plurality of serially mounted clips, an anvil for receiving a clip thereon with a length of tubing received within the confines of the clip. A jaw is closed to flatten the tubing and simultaneously compress and clench the clip in encircling engagement over the flattened tubing portion. Upon opening of the jaw, the clenched clip may be removed from the carrier strip and anvil of the tool, and an indexing mechanism will serially advance another clip in position on the anvil.

3,780,417

INSTALLATION TOOLING FOR PLASTIC LOCKING NUT IN STRIP FORM

Charles Edward Reynolds, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 761,063, Sept. 20, 1968, Pat. No. 3,624,867. This application Mar. 15, 1971, Ser. No. 124,455
Int. Cl. B23p *19/00*
U.S. Cl. 29—235 **1 Claim**



A tool is provided for installing each fastener of a row of interconnected fasteners within an aperture of a mounting panel. Each fastener includes a leg member which is arranged for insertion into the aperture and a head to limit that insertion. Each fastener is interconnected with adjacent fasteners in the row at the head by a web of bendable and severable material extending between the heads of the fasteners. The tool includes a chamber to hold the row of fasteners. The end fastener extends from the tool while bent at the web generally perpendicular to the remainder of the row so that it may be positioned for insertion of at least a portion of its leg member into the aperture. When the portion of the fastener is inserted into the aperture, a trigger operated hammer within the tool strikes the fastener to thereby sever it from the row and drive it fully into the aperture.

3,780,418

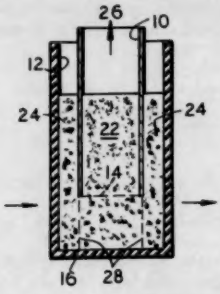
METHOD OF FABRICATING COMPOSITE MULTI-METALLIC BILLETS USEFUL FOR METAL WORKING OPERATIONS

Alvin L. Hurst, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 10, 1972, Ser. No. 296,006
Int. Cl. B22f *3/04*
U.S. Cl. 29—420 **6 Claims**

Method of fabricating compacted composite multi-metallic billets for metal working operations having at least two discrete metal constituents disposed in predetermined desired positional disposition therein. Included therein is the formation of at least a pair of discrete powdered metal receiving

cavities of predetermined configuration within a deformable shell, introduction of powdered metal therein and isostatic



compaction to predetermined desired density without appreciable change in the relative physical disposition of the metals, one to the other.

3,780,419

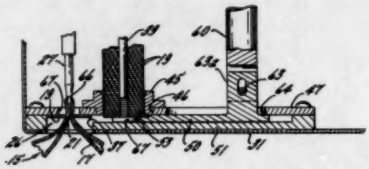
METHOD FOR SEALING BALLOONS AND THE LIKE

Rudolph L. Allison, and Gary L. Lindstrand, both of Rockford, Ill., assignors to MTL, Incorporated, Rockford, Ill.

Division of Ser. No. 133,143, April 12, 1971, Pat. No. 3,720,991. This application Aug. 28, 1972, Ser. No. 284,247

Int. Cl. B23p *11/02*

U.S. Cl. 29—451 **4 Claims**



An inflatable balloon is sealed gas-tight by forcing an intermediate section of the neck of the balloon through a hole in a disc sufficiently far to double the intermediate section over upon itself and to pinch the doubled-over portions together between the edges of the hole.

3,780,420

METHOD OF FILLET WELDING

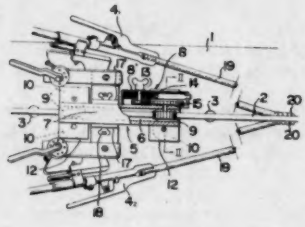
Masachika Ohta, and Toshio Wakameda, both of Otahara, Japan, assignors to Kawada Kogyo Kabushiki Kaisha, Toyama-ken, Japan

Filed Apr. 21, 1971, Ser. No. 136,066

Claims priority, application Japan, June 19, 1970, 45/53848

Int. Cl. B23k *31/02*

U.S. Cl. 29—471.1 **10 Claims**



A method and apparatus for fillet welding in which a pair of welding rod holders are provided on a feeding device so as to press welding rods on both parts to be welded and on both sides of one of them.

3,780,421

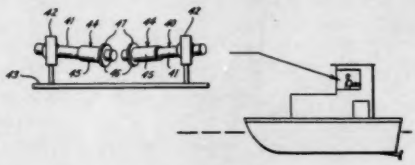
METHOD OF JOINING PIPES IN A HOSTILE ENVIRONMENT

William E. White, Jr., and Lloyd E. Billingsly, both of Houston, Tex., assignors to Hydrotech Services, Inc., Houston, Tex.

Division of Ser. No. 65,648, Aug. 20, 1970, Pat. No. 3,707,025. This application Aug. 17, 1972, Ser. No. 281,467

Int. Cl. B23q *3/00*

U.S. Cl. 29—466 **11 Claims**



A method and apparatus for joining the ends of two work pipes in a generally hostile environment and wherein the pipes are generally not parallel. The method includes loosely mounting work couplings on each of the work pipe ends and with each of the work couplings having biased flanges arranged to accommodate the bend which will occur in the pipe when the coupling is completed and wherein the couplings will have to be rotated relative to each other to arrive at the proper angular relationship therebetween. The work pipes are moved to the position such that the axes thereof intersect. The method includes constructing a model, preferably in a favorable environment, which is positionally representative of the work pipe ends and work couplings. Thereafter, the model couplings are manipulated to the mating position by trial and error. Preferably, the model couplings will be dimensionally representative of the work couplings and both the work couplings and the model couplings will have identical indicia, such as numerals, marked thereon. Once the mated position of the model couplings is known, the relative position of the indicia thereon is utilized to similarly manipulate the work couplings to the mating position, to thereby eliminate trial and error in aligning the work couplings in the hostile environment.

3,780,422

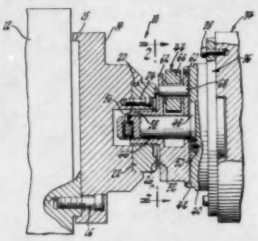
FRICTION WELDER AND FRICTION WELDING METHODS

Stanley W. Herman, Nashville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1971, Ser. No. 203,263

Int. Cl. B23k *27/00*; B29c *27/08*

U.S. Cl. 29—470.3 **3 Claims**



This friction welder has a rotatable head that drives an annular friction welding tool of a temperature stable material

across adjacent faces of workpieces held in a fixture. The tool is axially loaded against the workpieces and the resulting heat of friction in an annular weld zone generally corresponding to the dimensions of the tool causes material in the zone to plasticize and form a bond wiped across the adjacent faces which solidifies to connect the workpieces as the rotating friction engagement of the tool with the workpieces is terminated.

3,780,423

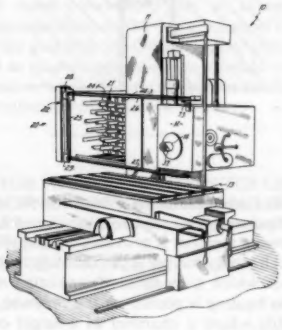
TOOL CHANGER

Alfred J. Lilienthal, Bourbonnais, Ill.; Theodore F. Johnson; William E. Petri, Jr.; and Charles E. Gilbert, Jr., all of Cincinnati, Ohio, assignors to Cincinnati Gilbert Machine Tool Co., Cincinnati, Ohio

Filed July 15, 1970, Ser. No. 54,896

Int. Cl. B23q *3/157*

U.S. Cl. 29—568 **72 Claims**



An automatic tool changer for use on a machine tool which moves tools in combinations of rectilinear movements between a spindle at a machine head and a rectangular array of compartments, parallel to the spindle axis, at a storage magazine. The storage magazine is mounted on the support of the machine tool to move in unison with the machine head, and includes a plurality of drawers which move at right angles to a pair of tool forks for transferring tools to and from the forks. The forks are independently linearly movable on a carriage which moves between the storage magazine and the machine head. One tool fork carries tools exclusively from the magazine to the spindle, and the other tool fork carries tools exclusively from the spindle to the magazine. The entire tool changer is movable relative to the machine head to insert tools into and withdraw tools from the spindle.

3,780,424

METHOD OF MAKING SILICON SOLAR CELL ARRAY

Americo F. Forestieri, Berea; Jacob D. Broder, Cleveland Heights, and Daniel T. Bernatowicz, Parma, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 26, 1970, Ser. No. 83,816

Int. Cl. H01l *15/02*

U.S. Cl. 29—572 **2 Claims**

A heat sealable transparent plastic film, such as a fluorinated ethylene propylene copolymer, is used both as a cover material and as an adhesive for mounting a solar cell array to a flexible substrate.

3,780,425

THERMOELECTRIC UNITS

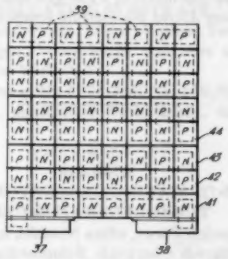
Alan William Penn, Reading, and Frank Neighbour, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 25, 1971, Ser. No. 109,485

Claims priority, application Great Britain, Jan. 30, 1970, 4,732/70

Int. Cl. H01l *15/00*

U.S. Cl. 29—573 **5 Claims**



In a thermoelectric unit comprising a plurality of thermoelectric elements, accurate spacing between adjacent elements is achieved by use of a cellular insulating material between adjacent thermoelectric elements and applying pressure during setting of the bonding medium so that the bonding medium occupies the pores of the cellular material.

3,780,426

METHOD OF FORMING A SEMICONDUCTOR CIRCUIT ELEMENT IN AN ISOLATED EPITAXIAL LAYER

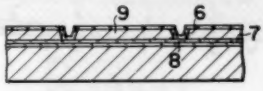
Yuichi Ono, Kokubunji; Hiroji Saida, Hachioji; Masayoshi Nomura, and Kyyotake Naraoka, both of Kokubunji, all of Japan

Filed Oct. 12, 1970, Ser. No. 80,104

Claims priority, application Japan, Oct. 15, 1969, 44/81877; Oct. 23, 1969, 44/84188

Int. Cl. B01j *17/00*

U.S. Cl. 29—580 **13 Claims**



Method for isolation comprising the steps of forming layers with a high impurity concentration along one surface of a semiconductor substrate growing a semiconductor epitaxial layer on one surface of the semiconductor substrate, said epitaxial layer having a conductivity type opposite to that of said high impurity concentration layer, forming at least one groove in said epitaxial layer in such a manner that the groove divides the said epitaxial layer into a plurality of regions, diffusing an impurity with opposite conductivity type to the epitaxial layer from all surfaces of the groove into the epitaxial layer and depositing a metal or an insulating layer in the groove.

3,780,427

OHMIC CONTACT TO ZINC SULFIDE DEVICES

Robert Jenkins, Cupertino; Carver A. Mead, Pasadena, and James McCaldin, So. Pasadena, all of Calif., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 824,898, April 25, 1969, Pat. No. 3,614,551. This application Oct. 28, 1970, Ser. No. 84,910

Int. Cl. B01j *17/00*

U.S. Cl. 29—590 12 Claims

A zinc sulfide body is treated to form an ohmic contact by applying a Group II metal or alloy thereof to a surface region of the body in the presence of a source of donor precursor such as a Group IIIa metal or a halogen and heating the region to a temperature above the melting temperature of the metal or alloy.

3,780,428

METHOD OF MAKING GENERATOR ROTOR OF TURBOGENERATOR UNIT

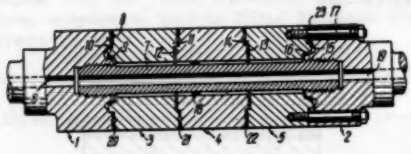
Nikolai Nikolaevich Zorev, ulitsa Novinki, 6, korpus 2, kv. 23; Viktor Vasilievich Chernykh, Belomorskaya ulitsa, 18, korpus 4, kv. 51, both of Moscow; Lazar Yankelevich Stanislavsky, ulitsa Mayakovskogo 11, kv. 24, Kharkov; Mikhail Mikhailovich Timofeev, ulitsa Velozavodskaya 11/1, kv. 323, Moscow; Ivan Vasilievich Kudryavtsev, Sharikopodshipnikovskaya ulitsa, 2, kv. 36, Moscow; Alexei Ilich Isaev, Sharikopodshipnikovskaya ulitsa, 36/8, kv. 300, Moscow; Nikolai Grigorievich Grinchenko, pereulok Vatutina, 16/25; Boris Volkovich Spivak, ulitsa Kossiora 56, kv. 55, both of Kharkov; Vladimir Alexandrovich Belov, Leningradskoi oblasti ulitsa Very Slutskoi, 9, kv. 32, Kolpino; Adolf Efimovich Kozik, Leningradskoi oblasti ulitsa Very Slutskoi 11, kv. 20, Kolpino; Adolf Ivanovich Shavrin, Leningradskoi oblasti prospekt Lenina, 45, kv. 17, Kolpino, and Jury Vasilievich Sobolev, Leningradskoi oblasti ulitsa Novgorodskaya 16, korpus 2. kv. 13, Kolpino, all of U.S.S.R.

Filed Nov. 3, 1970, Ser. No. 86,564

Claims priority, application U.S.S.R., Oct. 31, 1969, 1368152; Oct. 31, 1969, 1368153

Int. Cl. H02k *15/02*

U.S. Cl. 29—598 4 Claims



The invention relates to a method of making the generator rotor of a large-sized turbogenerator unit, said rotor comprising two end members and a few annular intermediate members welded together and to the guide member.

According to the invention some favourable compressive stresses are developed in the welded joints by means of the embracing stem fixed in position to the end members, said stresses adding much to the fatigue strength of said welded joints.

The welded and mechanical joints of the rotor, as well as the embracing stem are so designed that in the case of failure of one of the said joints the breakdown of the rotor is precluded.

3,780,429

METHOD FOR MANUFACTURING A BASE FOR THE ENVELOPE OF AN ELECTRIC COMPONENT

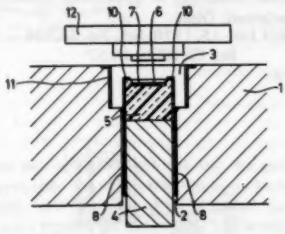
Hendrikus Johannes Christianus Friebel, Nijmegen; Simon Jonker, Emmasingel, Eindhoven, and Gerardus Cornelis Marie Benschop, Nijmegen, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,277

Claims priority, application Netherlands, Jan. 13, 1971, 7100410

Int. Cl. H01b *13/14*

U.S. Cl. 29—626 6 Claims



A method of manufacturing a base for the envelope of an electric component, for example a semiconductor device, in which a pressure member is provided on one side in the cavity of a jig, which cavity has an approximately rectangular cross-section, after which a member of insulating material which softens upon heating is placed on the pressure member from the other side where a chamber of a larger cross-section is present which communicates with the cavity, after which of a conductor grid the conductors of which are supported at one end by a strip and are bent at their other end transverse to the plane of the grid the ends connected to the strip are inserted into a narrow slot between the pressure member and the wall of the cavity until the bent ends of the conductors bear on the insulating member after which the chamber is closed by a closure plate, the jig is heated and a force is exerted via the pressure member, in which the bent ends of the conductors are forced against the closure plate by the insulating member and a part of the softened insulating material is forced between the conductors in the direction of the side walls of the chambers so that a base is formed the bent ends of which of the conductors are situated on the upper side of the insulating member and the parts of the conductors connected thereto with are embedded in the insulating material and the further part of the conductor project from the lower side of the insulating member.

3,780,430

PROCESS FOR MOUNTING ELECTRO-LUMINESCENT DISPLAYS

James Henry Feeney, Acton, Mass., assignor to Bowmar/Ali, Inc., Acton, Mass.

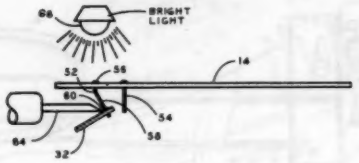
Filed Sept. 25, 1972, Ser. No. 292,129

Int. Cl. H05k *3/30*

U.S. Cl. 29—626 5 Claims

In a small hand-held calculator the electroluminescent display is in the form of a series of light emitting diodes ("chips") which are received on a printed circuit board. The electric signal output of the calculator circuit is communicated to the display through a series of pins which are stake mounted on a printed circuit board and the projected ends of these pins

serve the dual purpose of communicating electric signals which determine the display and also serve to mount the printed circuit board of the display and its associated components. The pins are inclined so that the display can be disposed at whatever viewing angle is desired. Thus, although the small calculator may lie flat on a desk or other support surface, the plane of the display is disposed at an angle making



viewing much more convenient, that is, at an angle approaching perpendicularity to the line of vision of the viewer.

By utilizing the pins both as electrical signal communicating means as well as mounting means it is possible to locate the display at whatever angle is desired and in a much more convenient and economical manner.

3,780,431

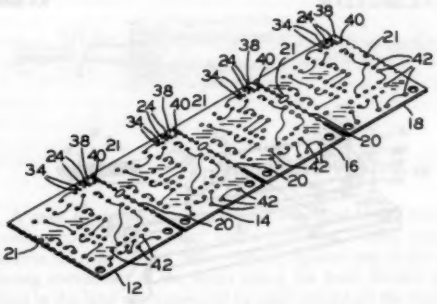
PROCESS FOR PRODUCING COMPUTER CIRCUITS UTILIZING PRINTED CIRCUIT BOARDS

James Henry Feeney, Acton, Mass., assignor to Bowmar/Ali, Inc., Acton, Mass.

Filed Sept. 25, 1972, Ser. No. 292,131

Int. Cl. H05k *3/30*

U.S. Cl. 29—626 **3 Claims**



In a process for producing calculator printed circuit boards, a pallet consisting of a plurality of printed circuit boards are interconnected by snapaway perforated edges at the adjacent side of the boards, so that the pallet consisting of plural boards is processible as a whole. Electrical elements or components have their terminals received through openings in the printed circuit board, which insertion is by machine utilizing a pantographic locating principle. Components are also assembled on the board by hand insertion. After inserting selected electrical components at the desired locations, and masking other locations, the electrical connections are then treated by fountain soldering to form electrical connections between the leads and the printed circuit. The soldering occurs to the pallet as a whole. The individual boards are then snapped apart and the board has enough dimensional stability so that it is rigidly clamped on a fixture and passed over a routing blade at a predetermined slight clearance therefrom so that all of the excess lead sections are trimmed from the subsurface of the printed circuit substrate. Further electrical devices can then be added and soldered in place and the printing circuit board together with its electrical components can then be positioned within a container for a computer application. The described process incorporates minimal handling and incorporates high speed machine assembly techniques wherein multiple operations occur simultaneously or repetitively at high speed.

3,780,432

METHOD OF ESTABLISHING RELATIVELY INSULATED CONNECTIONS BETWEEN CONDUCTOR ENDS AND AN INSULATING SUBSTRATE

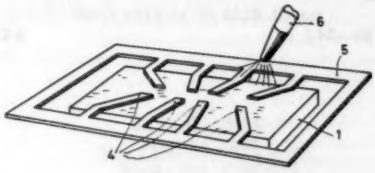
Gerardus Baas, and Frans Victor Willem Ten Bloemendal, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 10, 1971, Ser. No. 170,482

Claims priority, application Netherlands, Aug. 12, 1970, 7011885

Int. Cl. H05k *3/02*

U.S. Cl. 29—625 **5 Claims**



A method of establishing relatively insulated connections between the ends of metal conductors arranged in a mounting frame and an insulating substrate, the substrate surface being provided with a metal coating and the conductor ends being secured to said metallized surface, after which the metallized surface is subjected to a process attaching the metal coating so that the metal regions located between the conductor ends are removed from the substrate.

3,780,433

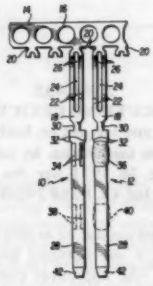
A METHOD OF MAKING AN ELECTRICAL CONNECTION USING A COINED POST WITH SOLDER STRIPE

James Edward Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 1, 1972, Ser. No. 248,964

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **2 Claims**



A connector post or pin is disclosed which is particularly suitable for use with printed circuit board assemblies. The post

includes a coined portion which is designed to permit the pin to be easily inserted into holes of a predetermined size in printed circuit boards, and to increase the quality of a solder joint between the post and the printed circuit board. A solder stripe is placed on each post in the coined region to facilitate soldering of the posts to conductive portions of the printed circuit board. The posts are attached in groups to break-away carrier strips to aid in the rapid assembly of large numbers of posts to printed circuit boards. The posts may also include provisions for coupling them to multilayered printed circuit assemblies. A method of fabricating the coined post is also disclosed which converts a post with normally an interference fit in a printed circuit board aperture to a post which is freely received in the aperture together with masses of solder adhered to said post.

3,780,434

HAIR-CLIPPING CUTTER SYSTEM

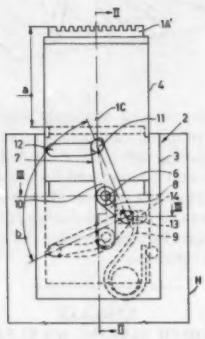
Jan de Boer, and Petrus Jozephus Johannes Vaes, both of Oliemolenstraat, Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1971, Ser. No. 139,569

Claims priority, application Netherlands, May 28, 1970, 7007686

Int. Cl. B26b *19/20*; **F16h** *21/44*

U.S. Cl. 30—34.1 **6 Claims**



Displacement device for a hair-clipping cutter system for a dry-shaving apparatus, the hair-clipping cutter system being displaceable by means of a sliding knob between an extended position and a retracted position in the direction of shifting of the sliding knob. The stroke of the sliding knob is smaller than the shifting distance of the cutter system.

3,780,435

CUTTING DEVICE

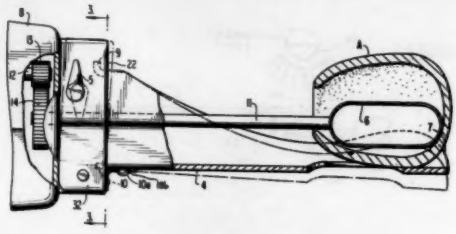
Bahia Rashid Farha, and Lloyd Lee, both of Charlton Heights, W. Va., assignors to said Farha, by said Lee

Filed Dec. 28, 1971, Ser. No. 212,943

Int. Cl. B26b *29/00*

U.S. Cl. 30—113.1 **11 Claims**

Apparatus for hollowing out an article of food such as a fruit or vegetable so that a substantially uniform predetermined thickness is formed. The apparatus comprises longitudinally extending blade means having a longitudinally extending curved guide means extending in substantially the same direction as the blade means and guiding the article of food while it is being hollowed. The article of food is rotated with its outside surface on the guide means while being simultaneously advanced onto the blade means. The guide means ensures that the blade means contacts the article of food at a position displaced from the longitudinal axis of the article of food and a predetermined distance from the surface of the ar-



ticle of food. The blade means is power driven to rotate around its own axis and when the article of food is rotated in the guide means a shell having a hollow area of transverse dimension greater than the transverse dimension of the blade means is formed. The distance between the guide means and blade means is adjustable to control the thickness of the shell.

3,780,436

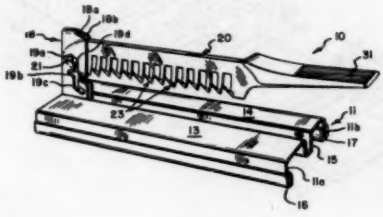
DEVICE TO CUT OR SEPARATE MASSES OF FROZEN FOOD

Ronald C. Pellman, Trumbull, Conn., assignor to Utica Cutlery Company, Utica, N.Y.

Filed May 24, 1971, Ser. No. 146,276

Int. Cl. B26b *1/04*

U.S. Cl. 30—123 R **9 Claims**



There is disclosed a frozen food cutter having a blade of toothed configuration, each tooth being of unique wedge-shaped and arcuate design.

3,780,437

ORTHODONTIC BRACKET

Alexander J. Wildman, Eugene, Oreg., assignor to Consyne Corporation, Glendora, Calif.

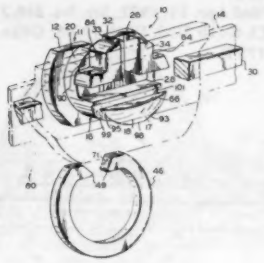
Filed Mar. 2, 1972, Ser. No. 231,139

Int. Cl. A61c *7/00*

U.S. Cl. 32—14 A **13 Claims**

An arch wire is held in a slot in a bracket body by a finger of a hook-like follower having a camming portion adapted to push the arch wire into the slot. The finger has a rounded labial surface blending with a labial portion of a head of the body

and has wedging surfaces adapted to move the follower to its open position. A snap ring engages somewhat abrupt shoulders on the follower to strongly hold the follower in its closed position, and engages less abrupt shoulders on the follower to weakly hold the follower in its open position. The body has a saddle horn portion to connect elastics to the body, and has notches for receiving auxiliary equipment.



3,780,438

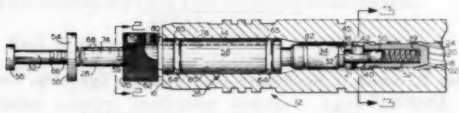
RIFLING LANDS INSPECTION GAGE

Robert J. Styczynski, Wynantskill, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 20, 1971, Ser. No. 173,521

Int. Cl. G01b 7/12

U.S. Cl. 33—174 R **6 Claims**



A gage for inspecting the lands of a rifled barrel bore for erosion comprises a slider and a push rod axially disposed therein for displacing a feeler radially against one of the lands during movement of the slider along the bore. Radial deviations in the land are measured by calibrations on the push rod and the location of a deviation is indicated by graduations on the slider. Numbered radial lines on a supporting plug, respectively referenced to the lands, indicate the one thereof contacted by the feeler.

3,780,439

SIMULATED DENTITION

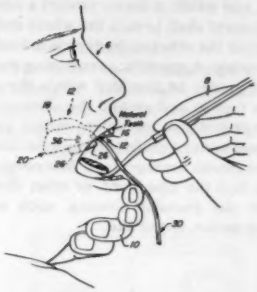
Richard C. Manor, Rt. 2, Box 182, Big Rapids, Mich., and Henry W. Osowski, P.O. Box 222, Chippawa Lake, Mich.

Filed July 15, 1971, Ser. No. 162,827

Int. Cl. A61c 19/00

U.S. Cl. 32—71 **1 Claim**

A simulated dentition for use by a dental student when studying and experimentally learning painstaking skills, dental practice, and chairside procedures comprising: an innovation expressly fabricated for placement and temporary retention within the confines of the oral cavity of a live in-the-chair student impersonating an actual patient. Made of non-deleterious material and structured to provide precisely contoured and compatible components upon which dental operative procedures can be capably evaluated and safely executed by the dental student. The first named student becomes a "dentist" and a second in-the-chair student provides the "patient." The essence of the concept pertains to the unique intra-oral dentition.



ERRATUM

For Class 33—174 R see:
Patent No. 3,780,438

3,780,440

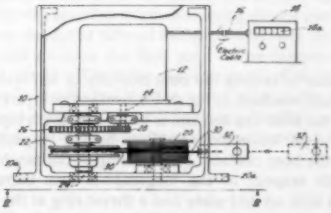
MEASURING INSTRUMENT

James L. Taylor, Laverne, Calif., assignor to Ideal Aerosmith, Inc., Cheyenne, Wyo.

Continuation of Ser. No. 841,654, May 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,346, Sept. 5, 1967, abandoned, which is a continuation-in-part of Ser. No. 574,622, Aug. 24, 1966, abandoned. This application July 21, 1971, Ser. No. 164,925

Int. Cl. G01b 3/12, 5/02

U.S. Cl. 33—139 **7 Claims**



An electronic measuring instrument is provided which includes an encoder having a control shaft and which generates electrical signals representative of angular increments of the control shaft and of the direction of rotation thereof, an extensible member with respect to the encoder housing is mechanically coupled to the control shaft and turns the control shaft in one direction or the other as the extensible member is moved in and out of the housing to measure linear distances, and a bidirectional electronic counter and display unit is electrically coupled to the encoder and responds to the electrical signals

from the encoder to provide an exact reading of the corresponding linear distances measured by the extensible member as it is moved in and out of the housing.

The extensible member, for example, may be a steel flexible tape which is stored within the housing of the encoder unit on a supply drum, and which is drawn around a wheel coupled to the aforesaid control shaft to turn the wheel and control shaft in one direction or the other as the tape is moved in and out of the encoder housing. Appropriate tensioning means, such as a "Negator" spring, may be provided within the encoder housing to draw the tape in and around the aforesaid drum. However, other linear distance measuring means may be used to turn the aforesaid control shaft, such as a flexible cord, a rigid rod, a rack and pinion arrangement. Moreover, other means may be used to bias the tape, cord, or other distance measuring means into the encoder housing, such as an external weight, a torque motor, or the like.

3,780,441

METHOD AND DEVICE FOR MEASURING THE CONCENTRICITY OF THE LAMINATED STATOR STACK OF AN ELECTRIC MACHINE

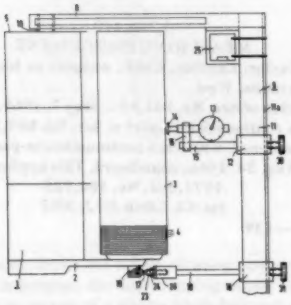
Paul Kunert, Erlangen, Germany, assignor to Siemens Aktiengesellshaft, Munich, Germany

Filed July 20, 1972, Ser. No. 273,540

Claims priority, application Germany, July 24, 1971, P 21 37 132.4

Int. Cl. B23f *23/08*; B23q *17/04*

U.S. Cl. 33—174 Q **8 Claims**



A method of testing the concentricity of the stator bore of an electrical machine as the stator lamination layers conjointly defining the bore are stacked is disclosed. Each layer is made up of several lamination sections having respective inside edges at the bore surface. The housing of the machine is centered with respect to the longitudinal axis thereof and is equipped with an end plate and a thrust ring at the excitation side and drive side of the machine respectively. The method includes the steps of arranging markers at equal spacing on a circle described on the end plate so as to be concentric with the longitudinal axis. Markers are also arranged at equal spacing on the thrust ring. The inside edges of the lamination sections are sensed with a sensing and measuring gauge to measure the distance between the inside edge of each lamination section and markers corresponding to the section being sensed. An apparatus for performing the method is also disclosed and includes a sensing and measuring gauge engageable with the markers corresponding to the section sensed to measure the distance between the edge of the section and the markers.

3,780,442

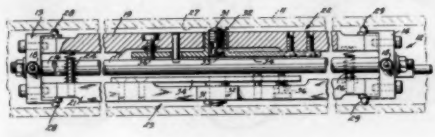
METHODS AND COMPOUND GAUGE DEVICES FOR MEASURING THE AXIAL CURVATURE OF A TUBE

William Milan Gresho, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Apr. 21, 1972, Ser. No. 246,210

Int. Cl. G01b *7/28*; E21b *47/08*; G01b *19/26*

U.S. Cl. 33—178 E **35 Claims**



A number of wall curvature gauges, e.g., two, are mounted independently on a rigid carrier, arrayed equiangularly about the axis of the rigid carrier, to form a compound gauge device. The compound gauge is advanced along the length of a tube, typically through the interior of the tube, with each component gauge generating an electrical signal having a voltage representative of tube wall curvature along the path traced by the respective gauge. The signals are processed concurrently to provide a single continous output voltage signal which is proportional to a weighted algebraic sum of the voltages generated by the individual wall curvature gauges. Where two diametrically opposed wall curvature gauges are employed, the weighted algebraic sum constitutes the difference in signal voltages generated by the two gauges. The single continuous output signal is representative of the pattern of an axial curvature component in a plane along the length of the tube, e.g., the plane defined by two diametrically opposed wall curvature gauges.

3,780,443

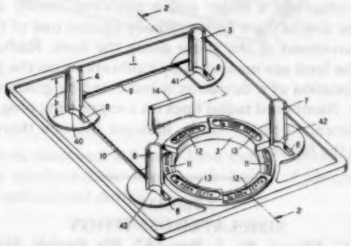
INSTALLATION GAUGE OR THE LIKE

Jay R. Smith, 1 Kenilworth Dr., Millburn Township, Essex County, N.J.

Filed Aug. 4, 1971, Ser. No. 168,998

Int. Cl. G01b *3/38*

U.S. Cl. 33—180 R **5 Claims**



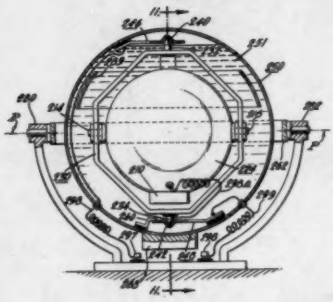
A gauge specifically designed for mounting on "roughed-out" closet bolts and waste fittings is disclosed to indicate the bolts lengths and fitting depths which insure a maximum seal efficiency in the waste system. The gauge is a substantially rectangular member having facilities for "plumbing" and leveling the gauge with a conventional level, upstanding curved members framing guide holes to indicate bolt lengths, and a waste connection guide having accurate surfaces to indicate the proper depth of the waste couplings.

3,780,444

GYROCOMPASS

Marvin Taylor, Plainview, N.Y., assignor to AMBAC Industries, Incorporated, Garden City, N.Y.

Filed May 12, 1971, Ser. No. 142,584
Int. Cl. G01c 19/38
U.S. Cl. 33—327 3 Claims



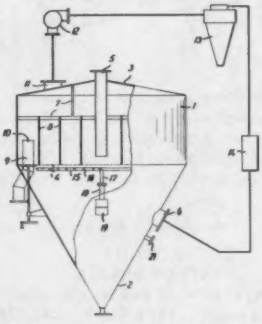
A pendulous gyrocompass of the type in which the rotor case if floated and the motor for driving the rotor in the rotor case is supplied with electrical power through a pair of specially-constructed electrically-conductive azimuth gimbal pivots of the needle-bearing type. The other gimbals in the gimbal support system may be relatively lower-grade bearings, with conventional arrangements for passing the motor current through or around them. The resultant gyrocompass may be of small size and low cost, and does not require servo's, pickoffs, torquers, sliprings, internal power supplies or other specialized compensating or correcting devices, yet provides an accuracy suitable for many applications.

3,780,445

CLEANSING DEVICE FOR POWDER PROCESSING APPARATUSES

Ove Emil Hansen, Vaerlose, Denmark, assignor to Aktieselskabet Niro Atomizer, Gladsaxevej, Sorborg, Germany

Filed Apr. 4, 1972, Ser. No. 241,031
Claims priority, application Denmark, Apr. 15, 1971, 1798/71
Int. Cl. F26b 17/10
U.S. Cl. 34—57 D 7 Claims



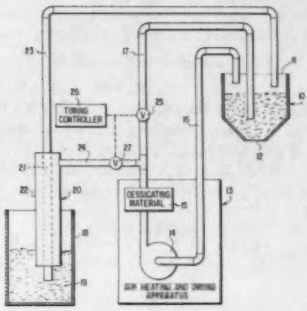
A cleansing device for cleaning perforated supporting plates in powder processing apparatuses, in which a flow of gas passes a perforated supporting plate more than one time or passes a number of perforated supporting plates for fluidizing a layer of powder on the plate or plates, comprising an arm parallel to the underside of the plate to be cleaned, said arm being provided with a number of gas nozzles connected with means for producing jets of gas shooting upwards against the underside, said arm being displaceable in a plane parallel to the underside of the plate in question.

3,780,446

AUTOMATIC HOPPER LOADER

Herbert H. Frimberger, Middlefield, Conn., assignor to Polymer Machinery Corp., Berlin, Conn.

Filed July 25, 1972, Ser. No. 274,985
Int. Cl. F26b 17/10
U.S. Cl. 34—57 R 10 Claims



An apparatus for automatically supplying plastic material to the closed hopper of an injection molding machine or the like, the hopper being provided with an air drying arrangement, including a suction blower, for drying the air and thus the plastic material in the hopper. The plastic material to be supplied to the hopper is maintained in a supply bin which is open at its upper end. A suction wand, including a pair of space concentric tubes which are open at one end, extends into the bin to a point below the level of the plastic material. The other end of the inner one of the pair of concentric tubes is connected to the interior of the hopper adjacent the upper end thereof for conveying the plastic material thereto, while the other end of the outer one of the pair of concentric tubes is connected to the outlet air tube of the drying arrangement, and hence the outlet of the suction blower. Finally, a valve arrangement is connected in the outlet tube from the suction blower. The valve arrangement is such that when it is in a normal first position, the outlet stream of air from the drying device passes into the hopper via the outlet tube of the suction blower, and when it is in a second position the flow path to the hopper via the outlet tube is closed off and the output stream of air from the drying device is conducted via the outer tube of the suction wand into the supply bin where it is drawn together with the plastic material, via the inner tube of the suction wand into the hopper.

3,780,447

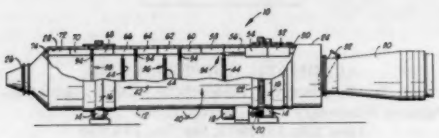
ROTARY DRYER

Howard S. Fales, West Redding, Conn., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 3, 1972, Ser. No. 240,630
Int. Cl. F26b 17/18
U.S. Cl. 34—136 8 Claims

An improved rotary dryer having radially extended flights generally near the material feed end of the dryer, and a dam

assembly having a movable ring segment rotatable between a dam position, wherein the movable ring segment extends in a direction transverse to the general direction of material flow



through the dryer, and a flight position, wherein the movable ring segment extends in a direction aligned with the general direction of material flow through the dryer.

3,780,448

APPARATUS FOR DRYING WASHED VEHICLES

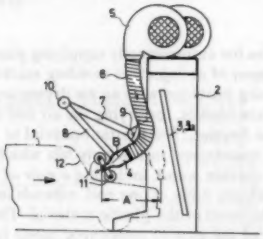
Ulrich Von Kulmer, Friedberg, Germany, assignor to Kleindienst & Co., Augsburg, Germany

Filed June 28, 1971, Ser. No. 157,088

Claims priority, application Germany, June 26, 1970, P 20 31 556.4

Int. Cl. F26b *19/00*

U.S. Cl. 34—229 **7 Claims**



The invention relates to apparatus for the drying of vehicles, comprising at least one blast nozzle mounted on a rocking lever and including an element capable of following the contour of a vehicle surface during relative movement between the vehicle and the apparatus, the rocking lever being mounted on a swivel pivot connected to drive means, so that the swivel pivot is moved in a direction to decrease effectively the rate of relative movement between the vehicle and nozzle during a drying operation on at least one inclined surface of the vehicle.

3,780,449

RESEARCH TEACHING TOOL

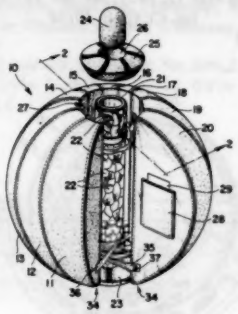
John Edward Stephenson, 893 Kennedy Rd., Toronto, Ontario, Canada

Filed May 1, 1972, Ser. No. 248,924

Int. Cl. G09b *1/02*

U.S. Cl. 35—1 **2 Claims**

The following specification discloses a novel teaching device and research tool made in the shape of a ball and composed of a plurality of segments interfitted like the segments of a citrus fruit and spaced apart from a hollow cylindrical core. The segments are made from polyurathane foam, covered with fabric and detachably fitted to one another and to the



cylinder. Base and cover members are provided to complete the ball-like appearance of the device.

3,780,450

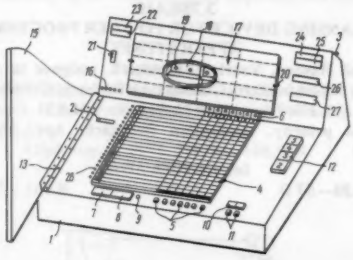
TEACHING MACHINE PREFERABLY FOR STUDYING FOREIGN LANGUAGES

Boris Ivanovich Podkopaev, Belomorskaya ulitsa, 22, korpus 3, kv. 19; Alexandr Vasilievich Bobkov, Tsvetochny kombinat, 14, kv. 2, and Ljudmila Dmitrievna Chervyakova, 4 Grazhdanskaya ulitsa, 34, korpus 1, kv. 71, all of Moscow, U.S.S.R.

Filed June 5, 1972, Ser. No. 259,918

Int. Cl. G09b *7/04*

U.S. Cl. 35—9 A **2 Claims**



A teaching machine preferably for teaching foreign languages using a program containing a set of algorithmic exercises is provided with a detachable decoder having indication means intended to indicate the locations of correct answers on the program-carrier containing the program of algorithmic exercises.

3,780,451

STUDY DEVICE

William T. White, 5110 W. School St., Chicago, Ill.

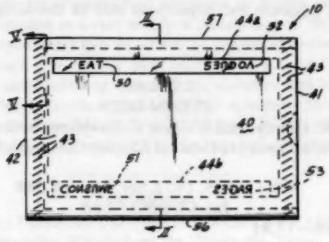
Filed Aug. 24, 1972, Ser. No. 283,328

Int. Cl. G09b *3/00*

U.S. Cl. 35—9 E **8 Claims**

A query and response study device having a frame member covered by a flexible sheet extending around the frame member with open ends, the sheet being slidable on the frame member, and the sheet having two spaced-apart transverse slots therethrough open to the interior of the frame, the frame accommodating cards having printed indicia thereon in lines.

The flexible sheet can slide on the frame to align the slots with a given line on one of the cards held internally of the frame whereby the indicia on that line represents a query. The frame



can then be turned over where the other slot will be found to be aligned with a line of printed indicia on the opposite side of the same card or on a different card, that line representing a response to the query.

3,780,452
METHOD FOR MOUNTING AND PRESERVING ANIMALS WITHOUT EVISCERATION

William D. Jackson, Brownwood, Tex., assignor to R. Ray Rankin, Brownwood, Tex., by said Jackson and Bell, a part interest

Filed May 28, 1971, Ser. No. 147,879
Int. Cl. G09b *23/36*
U.S. Cl. 35—20 **10 Claims**

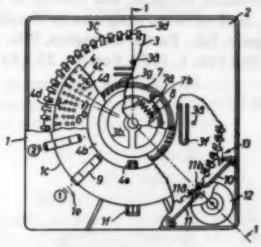
A method for preserving and hardening animals for display includes the steps of injecting the animal with a preservative solution and a setting agent. No evisceration or other preparation except washing and sealing of wound openings is needed. The preservative solution includes an aqueous formaldehyde solution, a formalin neutralizer, a mold inhibitor, and odorant, and a drying agent. The setting agent includes calcium sulfate, sodium chloride, and water. The preservative solution and setting agent are injected into the animal body beginning near the midsection thereof and advancing outwardly toward the extremities of the animal. The procedure is periodically repeated.

3,780,453
QUESTION AND ANSWER EDUCATIONAL GAME WITH AN ANSWER CONTROL DEVICE

Walter Hesener, 66, Rue de la Prulay, Geneve, Switzerland

Filed Mar. 30, 1971, Ser. No. 129,469
Claims priority, application Switzerland, Mar. 31, 1970, 4696/70; May 29, 1970, 8136/70; Sept. 5, 1970, 13300/70; Nov. 20, 1970, 17285/70; Nov. 30, 1970, 17659/70
Int. Cl. G09b *3/00*
U.S. Cl. 35—48 R **44 Claims**

An educational question-and-answer game has an answer verifying apparatus which has a code member having at least one code alignment, and a co-operating setting device. The latter device is supported by a supporting member. The code and supporting members are each provided with part of an indicating device, and can be brought into various relative positions which are differently designated by the indicating device, in such a way that the setting device is associated with a different longitudinal unit of code alignment in each of the said positions. The setting device can be moved into at least two positions in order to answer any one of the questions asked, and can be brought into registry with the appropriate longitudinal unit of code alignment. The answer verifying apparatus has means for multiplying its verifying capacity, which results from the number of different positions of the code member

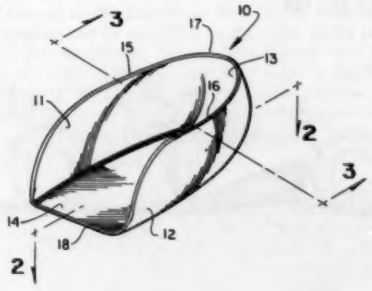


relative to the supporting member or the longitudinal units of code alignment, and for improving the enciphering of the possible verifications. Such means take the form of a plurality of differently designated setting devices (9) in FIG. 1 of the drawings for answering a corresponding plurality of questions per setting position of the code member (3, 4 in the drawings) relative to the supporting member (1). Alternatively the verifying capacity is enhanced by the construction of at least one of the code and supporting members (3, 4, 1) as parts (3, 4) which are each provided with part (3_g, 4_e) of a further indicating device. These parts can be brought into various relative positions, these positions being differently designated by the indicating device.

3,780,454
HEEL ENLARGER

Ernest Godwin, 157 Peachtree St., Atlanta, Ga.

Continuation-in-part of Ser. No. 121,477, March 5, 1971, abandoned. This application June 9, 1972, Ser. No. 261,450
Int. Cl. A43b *23/28*
U.S. Cl. 36—58.6 **2 Claims**



A heel enlarger formed to receive the heel of a human foot for effectively enlarging the size of the foot, and for insertion

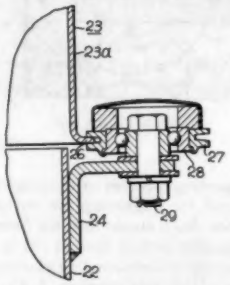
with the foot into the heel cavity of a shoe to enable the wearer of the shoe to fill or occupy the space in an oversized heel cavity of the shoe. The outer surfaces of the heel enlarger generally conform to the inner surfaces of the heel cavity of a typical shoe, while the inner surfaces of the heel enlarger generally conform to the shape of the heel of the human foot. The top edge of the heel enlarger is shaped to the shoe by marking the portion of the heel enlarger protruding above the upper edge of the side wall of the shoe with a line coinciding with the upper edge of the shoe and cutting along the line.

3,780,455

SNOWBLOWER DISCHARGE SPOUT WITH AIR INLET MEANS

William L. Stevenson, Mequon, and George J. Vertanen, Port Washington, both of Wis., assignors to Simplicity Manufacturing Company, Inc., Port Washington, Wis.

Filed Feb. 1, 1972, Ser. No. 222,533
Int. Cl. E01h *5/04*
U.S. Cl. 37—43 R **4 Claims**



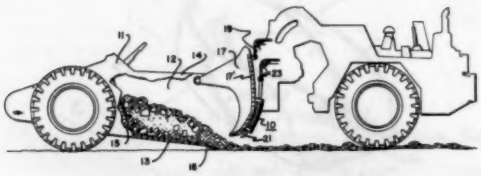
A snow blower, the frame structure includes a support for the discharge pipe, an adjustable chute positioned on antifriction devices carried by the upper end of such pipe and providing clearance between such pipe and chute for inspirating air into the chute to prevent clogging, and electric power means for swinging such chute which means are controlled by an operator from his station.

3,780,456

SECONDARY LIP FOR SCRAPERS

Orville P. Bronson, 5209 Targee, Space No. 14, Boise, Idaho, and Bruce L. Crabtree, Sr., P.O. Box 423, Snohomish, Wash.

Continuation-in-part of Ser. No. 234,361, March 13, 1972. This application Mar. 12, 1973, Ser. No. 340,624
Int. Cl. E02a *5/00*
U.S. Cl. 37—125 **3 Claims**



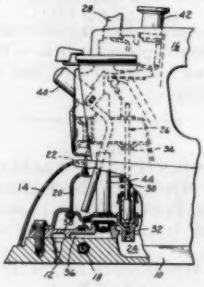
In a scraper excavating apparatus, the secondary lip comprises an apron skirt which is coextensive in width with, and is of sustantially similar curvature as, the apron of the scraper; guideways which are fastened at each side of the apron and which are operable to guide vertical travel of the skirt over the lower portion of the forward, exterior side of the apron; and a suitable actuator, such as cables, to selectively raise and lower the apron skirt with respect to the apron and to selectively dispose the lowermost terminal edge of the apron skirt contiguously adjacent the uppermost side of the scraper cutting bit.

3,780,457

STEAM IRON

Harold W. Gowdy, and William E. Davidson, both of Ontario, Canada, assignors to General Electric Company, Bridgeport, Conn.

Filed Feb. 5, 1973, Ser. No. 329,365
Int. Cl. D06f *75/06*
U.S. Cl. 38—77.81 **7 Claims**



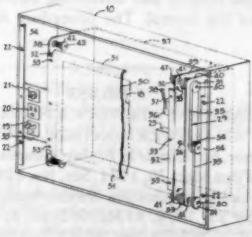
The invention is directed to a balanced pressure steam iron having a closed water tank and steam generating soleplate with control means to start and stop a metered flow of water. It has pressure balancing means connecting the steam generating soleplate and tank and a power spray means connected to the tank. In this conventional iron the invention provides an improvement in means to control pressure in the tank by supplying a coverplate overlying the soleplate to define steam passages therebetween and pressure ocntrol is provided by a continuously open pressure controlling conduit through the coverplate, the conduit containing an orifice and being formed to repel foreign particles whereby the single continuously open conduit controls both pressure within the iron and vents the iron for filling or emptying when upended.

3,780,458

PORTABLE VISUAL-AID OR DISPLAY DEVICE

Joseph M. Jacoby, 302 Carriage House Ln., Riverton, N.J., and Richard Gelak, Runnemede, N.J., assignors to said Jacoby, by said Gelak

Filed May 20, 1971, Ser. No. 145,173
Int. Cl. G09f *11/29*
U.S. Cl. 40—31 **2 Claims**



A rectangular portable carrying and display case of the attache type, adapted to stand vertically, is provided with a fully

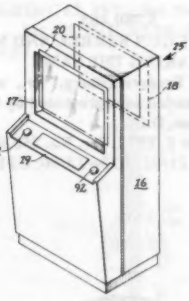
detachable front cover which is attached at the rear during use. At the front of the case, with the cover removed, a picture frame cover plate provides a viewing opening for observing visual-aid or display material in the form of a strip of paper or the like made up of individual elements or frame units connected end-to-end in a reel which is passed across the framed opening between two spaced rollers to display the information carried by each unit. Motor drive means with a hand-held control switch, and including overrunning clutches and belt drive for each roller, is connected therewith in a manner to wind the reel from one roller to the other in a forward direction past the viewing opening or to rewind it in the opposite direction.

3,780,459

APPARATUS FOR EXHIBITING DISPLAY PANELS

Donald D. Modglin, 924 Rodney Dr., Nashville, Tenn.

Filed Mar. 14, 1972, Ser. No. 234,498
Int. Cl. G09f *11/32*
U.S. Cl. 40—36 **6 Claims**



An apparatus for exhibiting display panels of the type in which each panel is provided with a top transverse rod having its end portions projecting beyond the lateral margins of the panel. The apparatus includes front endless carrier members for lowering the panels one at a time past a front viewing area, and rear endless carrier members for raising the panels one at a time past a rear viewing area for viewing the display on the rear surface of the panel. The apparatus further includes top transfer rails permitting the rod portions of the panels to feed down to the front carrier members from the rear carrier members, and declining transfer rails permitting the panels to gravitate down from the bottom of the front endless members to the bottom of the rear endless members. Escapement mechanisms are located at the lower end portions of the upper and lower rails for substantially simultaneously feeding one panel at a time to the upper end of the front endless members and to the lower end of the rear endless members. A single escapement lever is pivotally supported in the upward path of a panel on the rear endless members for engagement and simultaneous actuation of the escapement mechanisms.

The apparatus further includes separate front and rear motors for driving the corresponding endless members independently of each other, and control means for driving the motors at different times and at different speeds, if desired.

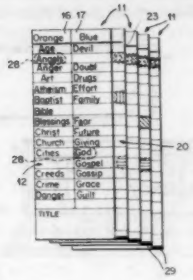
3,780,460

INDEX CARD FILING SYSTEM

John M. Hurt, Jr., 1030 Belvidere Dr., Nashville, Tenn.

Filed Apr. 20, 1972, Ser. No. 245,775
Int. Cl. G09f *9/00*
U.S. Cl. 40—78 **2 Claims**

An index filing system including a plurality of identical index cards, each card having parallel longitudinal columns of information symbols, and each information column having a color-coded heading. Each card further has a longitudinal



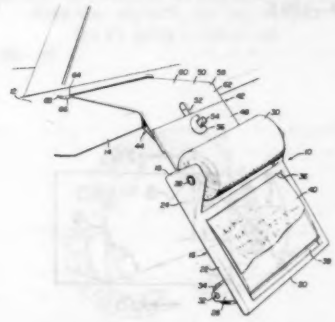
edge member including a plurality of color-code receiving spaces, each space transversely aligned with an information symbol in one or more information columns.

3,780,461

MOBILE LOG-NOTER

Theodore B. Russell, 2190 N.E. 124th St., North Miami, Fla.

Filed Oct. 4, 1972, Ser. No. 294,950
Int. Cl. G09f *19/02*
U.S. Cl. 40—86 **4 Claims**



A mobile log-noter having a backboard and supply and take-up rolls mounted on the backboard so that paper can be drawn over a central portion of the backboard by winding it from the supply roll onto the take-up roll, and clamps affixed to the backboard for receiving and gripping a projecting portion of a dashboard of a vehicle so that the log-noter can be mounted directly on the dashboard. Notes in the form of a log or memorandum can be recorded on the paper at the central portion of the backboard. The clamps include two plates which are extensible and retractable relative to the backboard and a fastener for holding the plates in a given position of adjustment. One plate may have a hook at its distal end for hooking onto a ventilation opening in the dashboard.

3,780,462

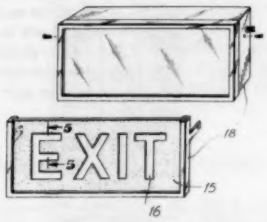
LUMINOUS INDICATORS INVOLVING PHOSPHORS

Alexander Pregel, and William A. Goldman, both of New York, N.Y., assignors to Canrad Precision Industries, Newark, N.J.

Continuation of Ser. No. 863,785, Oct., 1969, abandoned. This application Oct. 20, 1972, Ser. No. 299,502
Int. Cl. G09f *13/20*
U.S. Cl. 40—130 R **6 Claims**

Luminescent, specifically phosphorescent, indicia or insignia are disposed on a visible translucent substrate mounted on

a carrier wherein an artificial light source is disposed within the carrier rearwardly and spacedly of the substrate so that the heat of the source of light will not affect the luminescent properties of the phosphorescent indicia or insignia which latter are formed of homogeneously dispersed phosphor particles in glass or porcelain frit, and as such are bonded to the substrate.



3,780,463

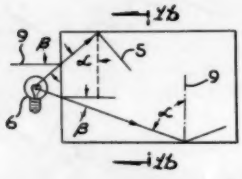
ILLUMINATED DISPLAYS AND ILLUMINARIES

Leonard S. Aronoff, 16751 Tupper St., Sepulveda, Calif.

Continuation-in-part of Ser. No. 855,197, Sept. 4, 1969, abandoned. This application May 15, 1972, Ser. No. 253,323

Int. Cl. G02b *5/14*

U.S. Cl. 40—130 K **9 Claims**



A display particularly adaptable for displaying a message comprising a light-carrying body and a source of light disposed along at least one edge of the body is disclosed. The message is placed in intimate contact with one surface of the light-carrying body. A contrasting backing material is disposed about and/or behind the message and is held in remote contact with the body. The edges of the body adjacent to the sources of light are shaped such that the edges are relatively normal to the incident light rays, thus allowing most of the light to refract through, thus easily entering the body.

3,780,464

FIRING MECHANISM FOR PERCUSSION LOCK FIREARMS

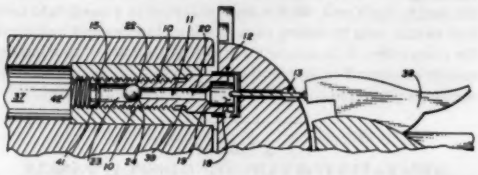
Harvey B. Anderson, 1203 Broadway, Yakima, Wash.

Filed Sept. 5, 1972, Ser. No. 286,608

Int. Cl. F41c *7/00*

U.S. Cl. 42—69 R **6 Claims**

A mechanism to replace the flash hole structure of either breech or muzzle loading percussion firearms to allow firing with metallic cartridge primers of present day commerce. The primer is enclosed by a removable cap during firing to prevent fragmentation. A relatively large flash hole is provided with a check valve to alleviate misfires and hangfires to prevent blow backs.



3,780,465

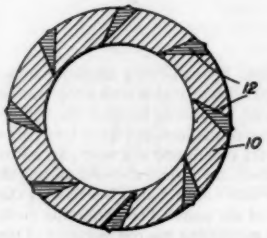
WEAR RESISTANT GUN BARREL AND METHOD OF MAKING THE SAME

Raymond J. Polcha, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 1, 1972, Ser. No. 258,622

Int. Cl. F41c *21/02*; **B23p** *13/00*; **C21d** *1/06*

U.S. Cl. 42—76 A **8 Claims**



A wear resistant gun barrel and method of producing it is disclosed. The barrel has hardened zones or lands which penetrate into the barrel material between rifling grooves and which are highly resistant to wear from repeated projectile firings. The hardened zones or lands are produced by heating a narrow zone on the outside of the gun barrel with a high intensity heat source, allowing any desired pattern to be melted into the steel. The molten zones, when cool, produce areas having increased hardness. The final step is to machine the gun barrel to the proper inner diameter and engrave rifling grooves between the hardened zones. In the case of large caliber gun barrels the hardened zones are provided in an inner liner which is then shrunk fit into the outer cylinder before the machining step is performed.

3,780,466

DEVICE FOR HOLDING FISHING RODS

Leroy Hadnot, 2715 May St., Cincinnati, Ohio

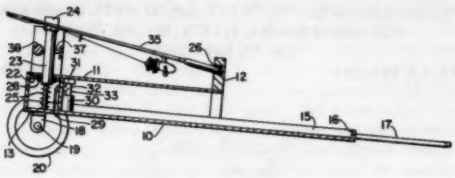
Filed Jan. 14, 1972, Ser. No. 217,804

Int. Cl. A01k *97/12*

U.S. Cl. 43—17 **1 Claim**

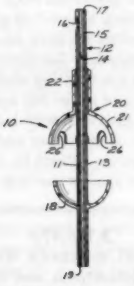
A device for carrying and holding a plurality of fishing rods so that the movement of the fishing rods cause a signaling

device to be actuated. The device comprises a frame having a pair of wheels at one end thereof and a cross member with



sockets therein to receive the rod handles. Each rod shaft is positioned over a spring mounted pistion which actuates the signal device.

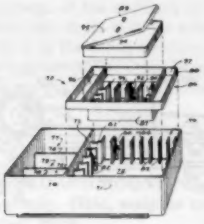
3,780,467
FISHING DEVICE
Lawrence R. Lueck, P.O. Box 1061, Victorville, Calif.
Filed Oct. 17, 1972, Ser. No. 298,335
Int. Cl. A01k *93/00, 97/02*
U.S. Cl. 43—44.87 **10 Claims**



A chum holding bobber which can be attached to a fishing line above a baited hook to distribute chum in the surrounding water for the attraction of fish. The bobber has a round tubular stem with an annular hollow for buoyancy; a chum holding cup, made of lightweight plastic, coaxially affixed to the stem to extend concentrically outwardly and upwardly so that its open side faces up; and a lightweight plastic cup with a larger mouth than the chum holding cup, slidably mounted on the stem above the chum holding cup with its open side down and having a downturned rim with scalloped indentations. The bobber is readied for use by loading the lower, chum holding cup with particulate chum, then sliding the upper cup into contact with the loaded lower cup. The rim or mouth of the chum holding cup nests within the larger mouth of the upper cup, but leaves portions of the scalloped indentations unobstructed to provide openings through which chum particles can escape into the water. A slight tug on the fishing line loosens more of the chum for distribution in the water when this is desired.

3,780,468
FISHING TACKLE BOX
William C. Maffett, c/o William C. Maffett and Associates, Smithville, Tenn.
Filed Oct. 20, 1972, Ser. No. 299,314
Int. Cl. A01k *97/00*
U.S. Cl. 43—54.5 R **3 Claims**

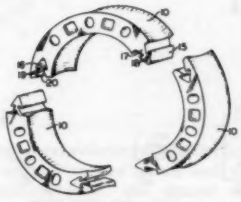
A fishing tackle box including a compartment having a wall structure in which top ledges are formed to receive the inverted ends of the fish hooks of freely suspended fishing lures. The top ledges may be formed of a soft material penetrable by the sharp ends of the fish hooks, such as a foamed plastic material; or an opening may be pre-formed in the ledge for receiving the end of each hook; or the wall structure may be



thin enough for each hook to hang over the top edge of a wall.

In the preferred form of the invention, the wall structure includes a plurality of spaced partition walls to form separate compartments for receiving the lures, and one form of the invention includes such wall structure in a cascade arrangement.

3,780,469
SECTIONAL CREATIVE TOY
John P. Hancovsky, Shaler Township, Allegheny County, Pa., assignor to Hi-Ho Products, Inc., Sharpsburg, Pa.
Filed May 18, 1971, Ser. No. 144,583
Int. Cl. A63g *11/00, 21/00*
U.S. Cl. 46—25 **6 Claims**

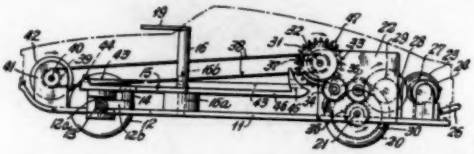


The specification discloses a creative toy of lightweight, durable material, such as a low-density polyethylene and plastic composition, which is made up of a plurality of interlocking arcuate sections capable of assembly in a variety of different ways to provide different life-size toys for juveniles, such as a hoop, slide or chair. Each section of the toy comprises a body portion of hollow, thin-walled and substantially rectangular cross-section having a protruding V-shaped tongue at one end and at the opposite end a recess of complementary and interlocking configuration to the tongue. The outer and inner walls of the body portion are curved inwardly and the side walls have shallow cups recessively molded therein for decoration and reinforcement purposes.

3,780,470
PROGRAMMABLE TOY VEHICLE
Robert E. Roberts, 523 Danbury Rd., and William D. Zdinak, 74 Raymond Ln., both of Wilton, Conn.
Filed Apr. 5, 1972, Ser. No. 241,145
Int. Cl. A63h *17/36*
U.S. Cl. 46—213 **9 Claims**

The toy vehicle disclosed comprises a chassis, a driving motor, directable front wheels and operating mechanism to steer

the vehicle, as it travels forward, to the left or the right under the control of a flexible member, such as a cord or cable which is wound on a program drum having a multiplicity of pegs projecting from its surface and arranged equispaced laterally in parallel circumferential rows, said cord being led from a storage spool around the program drum and between the pegs



by an eye on a lever connected to operate the steering mechanism of the vehicle when traveling in reverse direction, said spool and lever when the vehicle is operated in a forward direction unwinding said cord from the drum and causing the steering lever to operate the steering mechanism in a sequence of movements opposite to those made in operating the vehicle in reverse direction.

3,780,471

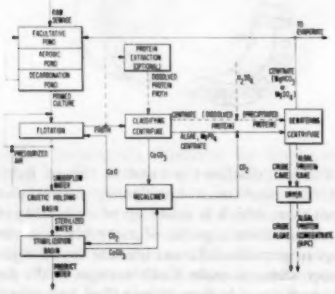
WATER RECLAMATION-ALGAE PRODUCTION

Jay E. Ort, Lubbock, Tex., assignor to Era Incorporated, Clovis, N. Mex.

Continuation-in-part of Ser. No. 55,570, July 16, 1970, Pat. No. 3,645,040. This application Feb. 28, 1972, Ser. No. 229,742

Int. Cl. A01g *7/00*

U.S. Cl. 47—1.4 **14 Claims**



Wastewater is treated in a manner which geratly reduces the level of organic waste matter, phosphates, fixed nitrogen, bacteria, virus and suspended solids. Water is reclaimed and an algae by-product is recovered by employing a series os three ponds with different depths and detention periods, each of which performs specific functions. A dissolved-air-lime flotation step is then used to separate suspended materials (primarily algae). After the flotation step the water is held at a high pH to achieve total disinfection prior to recarbonation to stabilize the water. The by-product algae material is refined by centrifugal classification of calcium carbonate from the slurry or, optionally, by alkaline hydrolysis of protein from the algae followed by acid precipitation to yield a high quality protein concentrate.

3,780,472

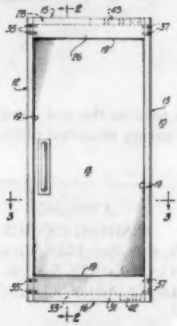
DOOR STRUCTURE

Lawrence F. Biebuyck, Niles, Mich., assignor to American Metal Climax, Inc., New York, N.Y.

Continuation of Ser. No. 59,981, July 31, 1970, abandoned. This application Dec. 1, 1971, Ser. No. 203,814

Int. Cl. E06b *3/00*

U.S. Cl. 49—501 **3 Claims**



There is provided an improved door structure of the type having a frame supporting a panel of glass or other suitable material and characterized by very narrow stiles. The stiles each have relatively heavy face portions connected by a transverse web and defining confronting shallow and deep glazing pockets. Spaced upper and lower rail assemblies interconnect the stiles, and are each provided with longitudinally extending screw splines. The ends of the upper and lower rail assemblies are coped so that the screw splines fit within the confronting glazing pockets and seat against the respective webs.

3,780,473

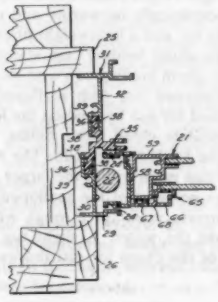
THERMAL BARRIER WINDOW

Walter A. Kort, New Philadelphia, and Eugene L. Brand, Clinton, both of Ohio, assignors to Alsco Anaconda, Inc., Akron, Ohio

Filed Aug. 13, 1969, Ser. No. 849,856

Int. Cl. E06b *3/28*

U.S. Cl. 49—62 **4 Claims**



A window unit having a stationary window frame and an upper and lower sash slidably mounted within the frame is disclosed. The window frame includes interior and exterior metal portions and a thermal barrier element interspaced therebetween to minimize heat transfer from and moisture condensation on the interior metal portions. The metal portions are joined to the thermal barrier element by providing each metal portion with an elongated U-shaped female por-

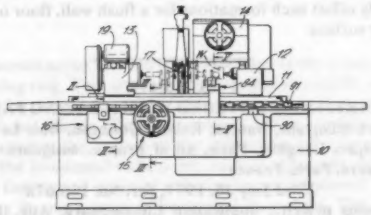
tion which receives an elongated male portion of the thermal barrier element. Longitudinally spaced portions of at least one leg of each U-shaped female portion are plastically deformed into longitudinally extending channels formed in the male portions to complete the connection. The upper and lower sashes are each provided with a nonmetallic thermal barrier sash guide providing the sole contact between the sashes and their tracks formed in the stationary frame to minimize heat transfer through the sash guide from the interior metal portions of the window frame. The upper and lower sashes are each provided with a storm window unit having a nonmetallic thermal barrier frame which covers substantially all interior exposed lateral surfaces of the window sash to prevent moisture condensation thereon.

3,780,474

TABLE POSITIONING DEVICE FOR GRINDING MACHINE

Hiroshi Ota, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed June 17, 1971, Ser. No. 153,992
Claims priority, application Japan, June 23, 1970, 45/54636
Int. Cl. B24b *5/42*
U.S. Cl. 51—105 SP **9 Claims**



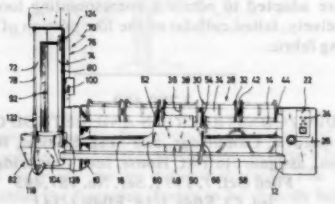
A table positioning device for a grinding machine to grind work pieces with multiple grinding portions is provided which comprises measuring means for measuring a first grinding position of the work pieces, a fine transferring device regulated by the measuring means to position the table of the grinding machine in a first grinding position, and a table indexing device including an index plate mounted on the table with notches at corresponding intervals of the multiple grinding portions and an index pin adjustably provided on a bed of the grinding machine, the index pin being engageable with the notches to set the table at the corresponding grinding positions.

3,780,475

TUMBLER WITH DRUM TRANSFER APPARATUS

Manfrid Dreher, Salmbach, Germany, assignor to Dr.-Ing. Manfrid Dreher KG, Engelsbrand, Germany

Filed Apr. 23, 1971, Ser. No. 136,844
Int. Cl. B24b *31/02*
U.S. Cl. 51—164 **9 Claims**



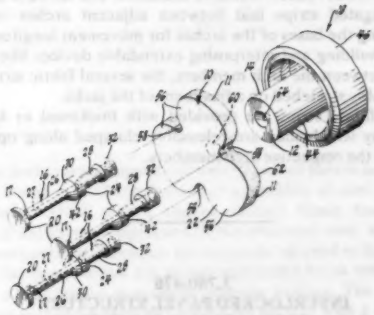
At least one hollow rotatable drum is movable between a first and a second position in the latter of which it can receive and discharge its contents. First displacing means is provided for displacing the drum between its positions. Container means is movable between an upper and a lower position in which it is respectively located above and below the level of the drum when the latter is in the second position thereof. A hoist or similar means displaces the container means between the upper and lower positions thereof. Connecting means connects the interiors of the drum and the container means and enables gravity discharge of the contents of the drum to the container means when the drum is in the second position and the container means is in the lower position, and of the contents of the container means to the drum when the former is in the upper is in its upper position and the drum is in its second position.

3,780,476

GRINDING WHEEL AND MOUNTING ASSEMBLY

Therell L. Sipe, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1972, Ser. No. 278,768
Int. Cl. B24b *45/00, 55/02*
U.S. Cl. 51—168 **3 Claims**



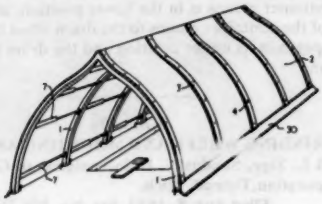
A solid grinding wheel substantially in the form of a cloverleaf having equiangular spaced petals and the like spaced roots defined therebetween, the spaced roots receiving flanged retaining pins securing the grinding wheel to a rotatable drive shaft. The shanks of the flanged retaining pins include a portion of increased diameter including a tapered cam surface engaged by a like tapered cam surface on an adjustable nut of a chuck mounting assembly. The adjustable nut is internally threaded and received upon a sleeve in the chuck assembly and presents a tool receiving end through which the shanks of the retaining pins are received with the flanges engaging the outside surface of the grinding wheel. Tightening movement of the nut engages the mating tapered cam surfaces axially moving the retaining pins drawing the grinding wheel into engagement with an end of the driving shaft. A conical protuberance is provided on one surface of the grinding wheel and is received in a like recess in the end of the driving shaft thereby aligning the wheel on the shaft prior to firmly securing it by rotation of the adjustable nut. Coolant fluid passages are provided in the flanged retaining pins so that coolant fluid is directed onto work engaging surfaces of the grinding wheel beneath a wind barrier created when the wheel is rotated at high speeds. The adjustable nut can be formed to accommodate a fluid collector sleeve which is secured to the nut and extends away from the grinding wheel terminating in an arcuate portion receiving coolant discharged from a source under pressure, the fluid being received by the collector sleeve and directed through the passages in the flanged pins for discharge onto the grinding wheel work engaging surfaces.

3,780,477

DEMOUNTABLE BUILDING

Philip D. Sprung, Jr., 1201 Sifton Blvd., Calgary, Alberta, Canada

Filed July 28, 1971, Ser. No. 166,861
Int. Cl. E04b *1/32*
U.S. Cl. 52—86 1 Claim



A demountable building embodying a fabric covered framework of spaced arch-like members. The fabric is applied in elongated strips laid between adjacent arches and by mounting the bases of the arches for movement longitudinally of the building and interposing extendable devices like screw jacks between the arch members, the several fabric strips can be suitably stretched on adjustment of the jacks.

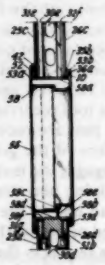
The fabric strips are provided with thickened or beaded edges by which they are releasably clamped along opposite sides to the respective arch members.

3,780,478

INTERLOCKED PANEL STRUCTURE

John Pavlecka, 8797 Capital St., Oak Park, Mich.

Filed Dec. 20, 1971, Ser. No. 209,790
Int. Cl. E06b *3/54*; E04b *5/52*; E06b *1/04*
U.S. Cl. 52—206 28 Claims



A structure for hollow walls, floors and flat roofs of houses, buildings, trailers, mobile homes, vans, containers, etc., in which two parallel rows of panels and door and window frames are locked into unity crosswise and lengthwise by keying members inserted slidably into interlocking means on the panels and on the jambs of the frames; moreover, top and bottom mounting boundary channels and door and window frame lintels are provided with laterally interfitable formations, and the panels with matching formations, the latter being entered at assembly inbetween the former; as the keying members—which may be the studs, joists, or rafters themselves or lightweight linear keys—are inserted into their interlocking engagement with the panels and the jambs, the panels are displaced laterally into a crosswise interfit with the channel and lintel formations, the keying members thus effecting a simultaneous three-dimensional interlock of all the components of the structure; clearance holes in the top channel and in the window lower lintel admit the keying members for insertion.

In floor and flat roof structures boundary channels as "-headers" enclose all four outer sides, and both those at right angles to the keying members—be they the joists or raftes themselves or linear keys—and those parallel with them are interfitted laterally with the upper and lower deck panels as in the walls, i.e., by the keying members inserted inbetween the decks through openings in one of the channels.

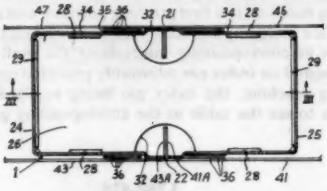
The complete structure embodies weather seals at all vertical and horizontal seams; corner voids in the bottom channel and in the door and window lintels for receiving fallen-in particles; means on the channels for supporting or retaining peripheral basement and roof shroud members; and a window lower lintel divided into a panel engaging channel with keying member insertion openings therein, and a window sill as a cover therefor. Continuous and discontinuous species and subspecies thereof of the means for carrying the laterally interfitted formations on the panels are disclosed, as are inwardly offset such formations for a flush wall, floor or roof exterior surface.

3,780,479

PARTITIONS COVERED WITH A FACING FABRIC

Patrick Billarant, Nantes; Robert Goubeau, Bois Le Roi, and Jacques Langlois, Paris, all of France, assignors to Velcro France, Paris, France

Filed July 28, 1971, Ser. No. 166,678
Claims priority, application Luxembourg, Aug. 10, 1970, 61491
Int. Cl. E04b *2/72*
U.S. Cl. 52—222 4 Claims



The post has at least one slot extending over the entire height of said post and into which a portion of a facing fabric applied against the post and at least one partition adjacent said post can be inserted, while fastening elements carried by said post at locations thereon which are to be covered by the facing fabric are adapted to retain a corresponding looped, fluffy, down, velvety, felted cellular or the like portion of the back of the facing fabric.

3,780,480

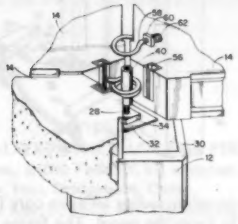
BUILDING CONSTRUCTION AND METHOD OF SAME

Alex Cvijanovic, Cambridge, and Sepp Firnkas, Boston, both of Mass., assignors to TAC House, Inc., Cambridge, Mass.

Filed Oct. 7, 1971, Ser. No. 187,445
Int. Cl. E04c *3/34*; E04b *1/343*
U.S. Cl. 52—227 8 Claims

A building construction and method which utilizes columns and precast concrete, generally rectangular, horizontal floor

slabs. A first set of columns is erected at the building site and post-tensioned. Then the horizontal slabs are lifted up and positioned with the corners thereof resting on the upper ends of the columns. In the preferred embodiment, each slab has a vertically extending pin secured to the slab at each corner. After the slabs are positioned on the columns, a locking ring is dropped over the pins with the upper edge of the ring extending above the upper horizontal surface of the slabs. A second series of columns is erected in vertical alignment with the previously erected and post-tensioned columns. Each column



in the second series rests on the upper edge of the corresponding locking ring. This arrangement provides essentially a point support for the column which permits very easy vertical alignment of the column. Once the column has been aligned, the space between the bottom of the column and the upper surface of the horizontal slabs is dry packed. After the dry pack has set, the second series of columns is post-tensioned before receiving the next series of horizontal floor slabs. The resulting connection between the column and slabs provides a "semi-rigid" connection which is suitable for use in buildings that are constructed in earthquake zones.

3,780,481

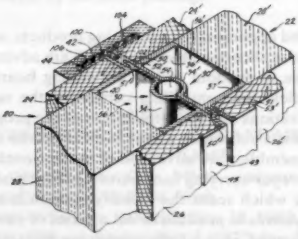
COMPOSITE PANEL FASTENING DEVICE HAVING INTERLOCK FEATURE

Harold E. Tomkins, Glendale, Calif., assignor to Myers Double Tee Structures, Inc., Los Angeles, Calif.

Filed Apr. 15, 1971, Ser. No. 134,124

Int. Cl. E04b *2/60*

U.S. Cl. 52—265 **26 Claims**



A fastening device for fastening together a pair of elongate planar boards in parallel spaced relation to form a composite panel has interlock means defined thereon. The interlock means enables the fastening device to be directly interlocked with an identical fastening device of another composite panel so that the two panels may be locked together in adjoining relation.

3,780,482

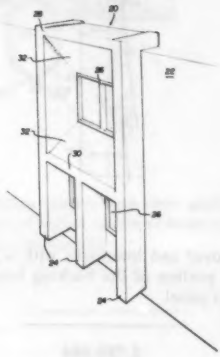
PREFABRICATED STRUCTURAL UNIT AND METHOD

Cornelis J. De Lange, Farmington, Mich., assignor to Cement Enamel Development, Inc., Detroit, Mich.

Filed Jan. 26, 1972, Ser. No. 220,854

Int. Cl. B44f *9/04*, *7/00*

U.S. Cl. 52—309 **5 Claims**



The prefabricated structural unit disclosed herein includes a metal frame or skeleton formed of a plurality of steel studs or channels welded into a shaped unitary frame having the general exterior configuration of the structural unit. Asbestos-cement panels or sheets are permanently secured to the exterior of the frame which are joined and sealed by an adhesive to form a continuous monolithic exterior surface. The exterior surface is then finished by coating the surface with a cementitious matrix into which is distributed a stone or other aggregate providing a precast monolithic appearance.

The disclosed method of forming a prefabricated structural unit includes welding the steel channels or studs into a relatively lightweight unitary frame structure, permanently securing the asbestos-cement panels over the exterior of the frame, as by nailing the panels directly to the frame, and joining and sealing the panels with an adhesive. A cement matrix is then applied over the panels and a stone aggregate is distributed in the matrix while the matrix is in the fluid state. The exterior surface is then dried, wherein the cementitious matrix forms a substantially continuous layer with the cement-asbestos panels.

3,780,483

BUILDING SIDING UNIT WITH INTERLOCKING BACKING BOARD AND OUTER PANEL

Lee Herbert Mattes, South Bend, Ind., assignor to Mastic Corporation, South Bend, Ind.

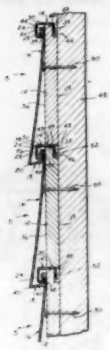
Filed Nov. 9, 1971, Ser. No. 197,031The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.

Int. Cl. E04b *2/08*; E04c *2/46*

U.S. Cl. 52—550 **3 Claims**

A siding unit for a building or like structure which includes an outer panel and a backing board. The outer panel of the siding unit includes a hook-shaped butt portion which is adapted to interlock with the siding unit in the lower adjacent

siding course. The outer panel also includes a rearwardly extending downturned hook part at its upper marginal portion



which is fitted over and interlocks with a lip formed in the upper marginal portion of the backing board located at the back of the outer panel.

3,780,484

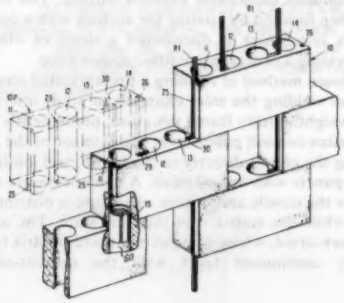
UNIVERSAL BLOCKS

George B. Muse, Hillcrest Dr., Calhoun, Ga.

Continuation-in-part of Ser. No. 83,939, Oct. 26, 1970, Pat. No. 3,693,307, which is a continuation-in-part of Ser. No. 252, Jan. 2, 1970. This application June 23, 1971, Ser. No. 155,946

Int. Cl. E04b *2/46*; **E04c** *1/08, 1/10*

U.S. Cl. 52—585 **8 Claims**



A wall structure and a block for forming same in which the block is generally rectangular and divided along its length into four substantially equal parts with a vertical hole centrally positioned through each of the four parts. Each of the four parts also has an alignment groove such that when two overlying blocks in adjacent courses of blocks overlie by any number of one-fourths of the length of a block, at least some of the alignment grooves and vertical holes will be vertically aligned. Expandable aligning rods are provided to be received within the aligned aligning grooves and to extend through several courses of blocks to assure vertical alignment of a plurality of blocks vertically disposed, and long or short expandable sleeves are inserted into the aligned vertical holes and filled with mortar to lock the blocks together and rigidify the wall structure.

3,780,485

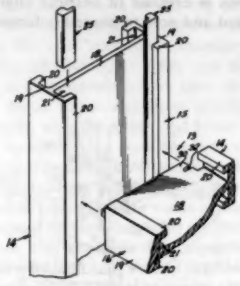
STRUCTURAL PANEL

Robert P. Matson, P.O. Box 9986, Atlanta, Ga.

Filed Feb. 22, 1972, Ser. No. 227,883

Int. Cl. E04c *2/42, 5/04*

U.S. Cl. 52—665 **5 Claims**



A structural panel including an open core frame covered by skin elements to form the panel. The frame is made up of I-beams which are connected together with an interlock to form joints. One of the I-beams in each joint has a tongue which fits between the flanges of the other I-beam and is notched to receive a retaining rib of the interlock. A lip on the flange retains the interlock in place.

3,780,486

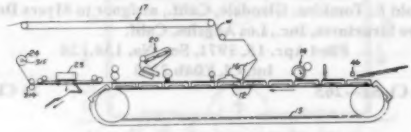
METHOD OF PACKAGING

Hans A. Jensen, Madison, and Melvin M. Layman, Waunakee, both of Wis., assignors to Oscar Mayer & Co., Inc., Madison, Wis.

Division of Ser. No. 16,787, March 5, 1970, Pat. No. 3,645,065. This application July 29, 1971, Ser. No. 167,221

Int. Cl. B65b *57/00*; **B65c** *9/08*

U.S. Cl. 53—14 **3 Claims**



A method and apparatus for packaging products, such as assemblies of bacon slices and the like, which are advanced from a supply source in random order on backing boards having identifying indicia for controlling certain of the subsequent packaging operations and the application of the proper one of two differnt labels according to the indicia on the respective boards. The assemblies are advanced to the horizontal top run of a lower conveyor carrying successive package platters, past an electric eye which scans the identifying indicia and which actuates mechanism to position or set a series of cams carried on the back face of each of the packaging platters for controlling subsequent operations. An upper conveyor carrying package forming platters for mating with the platters on the lower conveyor lays down a covering web and forms vacuumized and sealed packages between pairs of mating platters. The cams control operation of mechanism for applying adhesive to the backing board prior to advance of the boards to the upper conveyor and also a label applying device beyond the upper conveyor which has a dual label supply magazine and an

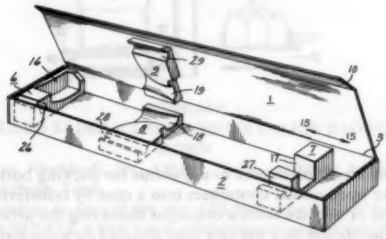
associated adhesive activator and applicator for applying to the packages either of two labels according to the cam setting on the bottom of the platter on the lower conveyor which carries the package. The apparatus includes a platen identification printer and a code dater preceding and following the labeling device. Upon the application of the label, the packages are transferred to the bottom run of an outfeed conveyor having package suspending pins which carry the connected packages between a vertically reciprocating trimming die and a co-operating bottom anvil for severing the packages from the web so as to permit discharge of the separated packages from the apparatus with the waste resulting from the trimming operation being forced loose from the pins and wound on a reel at the end of the outfeed conveyor.

3,780,487

UNIVERSAL-TYPE PACKAGE FOR FIREARMS

Harold C. Munson, Little Falls, N.Y., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Apr. 3, 1972, Ser. No. 240,657
Int. Cl. B65b 5/04
U.S. Cl. 53—35 **3 Claims**



This invention relates to a unique firearm package for the handling, storage, and transportation of firearms. The package contains supporting blocks of polystyrene foam which receive and support the gun assembly by sandwiching the stock and barrel therebetween. The universality of the package is achieved by contouring one or more of the supporting blocks to conform to a select portion of the gun which has a common shape and dimensional feature with like guns of a class. Thus, any one of a series of guns of a varying shape and size can be accommodated by the same package.

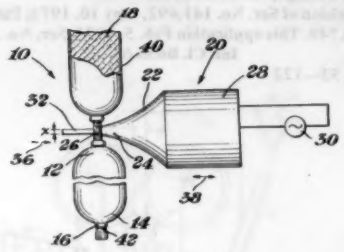
3,780,488

CLOSURE FOR FILM PACKAGES AND METHOD OF MAKING SAME

Arthur D. Herrell, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 878,462, Nov. 20, 1969, Pat. No. 3,667,594. This application Feb. 3, 1972, Ser. No. 223,324
Int. Cl. B65b 7/00, 51/22
U.S. Cl. 53—38 **3 Claims**

A method of forming improved film packages of a type wherein one or more of the package ends or regions is gathered and tied closed by encircling metal bands, closure clips or other closure devices. The resultant closure of compressed film is made leak-proof by application of ultrasonic vibratory energy to the package in the vicinity of the gathered region of film. The invention in its modified embodiments further invisions elimination of present bands, closure clips or other closure devices by using instead a temporary film



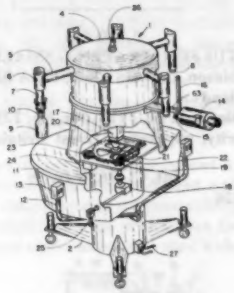
gathering and holding means, and then applying ultrasonic energy to the gathered region of film to form a permanent closure not requiring a band or clip.

3,780,489

VACUUM PACKAGING APPARATUS

Thomas E. Waldrop, Greer, and Philip L. Reid, Duncan, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed June 1, 1972, Ser. No. 258,665
Int. Cl. B65b 31/06
U.S. Cl. 53—112 B **6 Claims**



This invention is a method and apparatus for vaccum packaging articles in flexible pouches or bags wherein the apparatus has a plurality of vacuumizing nozzles and includes pouch sealing means. Each nozzle is vertically mounted at the end of a rotatable arm, the arms resembling spokes in a horizontal wheel. The neck of a filled bag is placed around the barrel of the nozzle, and the nozzle clamps the bag neck between the barrel and a plunger coaxially located in and below the opening to the barrel. The bag remains in this clamped position as it rotates around to a pouch sealing means which is synchronized to meet the bag and close, seal, and sever the bag from the nozzle. When severed, the bag may drop onto a conveyor belt.

3,780,490

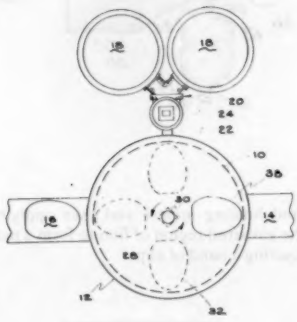
SHAPED AND FORMED MEAT PRODUCTS MANUFACTURE

Warren R. Schack, Western Springs, and Francis Glenn Connick, Downers Grove, both of Ill., assignors to Swift & Company, Chicago, Ill.

Division of Ser. No. 141,492, May 10, 1971, Pat. No. 3,730,740. This application Feb. 5, 1973, Ser. No. 329,326

Int. Cl. B65b *63/02*

U.S. Cl. 53—122 **9 Claims**



Method and apparatus for rapid and accurate filling of meat containers with solid meat pieces having the muscle fibers thereof arranged in substantial parallel alignment with the longest dimension of the meat container to produce an improved appearance and melding of the meat surfaces into a superior unitary product. The solid meat pieces are passed under a constant positive pressure through a side wall of a volumetric forming chamber along a horizontal plane and in the direction of the longitudinal axis thereof and thereafter the formed product is transferred intact to an identically shaped container.

3,780,491

APPARATUS FOR WRAPPING SMALL ARTICLES

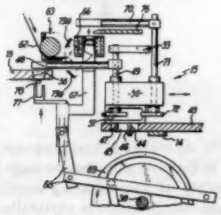
William S. Robinson, Carvers Close, 112A Blagreaves Ln., Littleover, England

Filed Feb. 11, 1972, Ser. No. 225,466

Claims priority, application Great Britain, Feb. 19, 1971, 4,973/71

Int. Cl. B65b *49/06*

U.S. Cl. 53—226 **25 Claims**



Apparatus for wrapping small articles, especially sweets, having wrapping units mounted one at each end of a reciprocating carrier which moves between two delivery stations in the form of apertured discs, each wrapping unit having means for picking up a sweet from its associated disc and means for drawing wrapping paper from a supply and locating the paper and the sweet in pre-wrapping positions preparatory to wrapping the paper around the sweet, the arrangement being such that in each limit position one wrapping unit is picking up a sweet from its associated disc while the other wrapping unit is wrapping a sweet previously picked up from its disc. There can be two or more wrapping units at each end of the carrier.

3,780,492

APPARATUS FOR PACKING BOTTLES, JARS OR LIKE INTO CASES

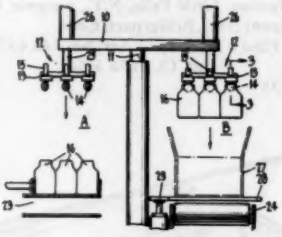
Henry Morgan Corderoy, Gladesville, New South Wales, Australia, assignor to ACI Operations Pty. Limited, Melbourne, Victoria, Australia

Filed Feb. 2, 1972, Ser. No. 222,794

Claims priority, application Australia, Feb. 5, 1971, 3950

Int. Cl. B65b *39/02*

U.S. Cl. 53—247 **3 Claims**



This invention relates to apparatus for packing bottles, jars or like open-ended containers into a case by transferring said bottles or the like from a conveyor delivering the articles to a pick-up station to a packing case situated on a discharge conveyor at a loading station.

The invention broadly comprises an arm pivotal through a full circle in two separate movements each of 180° whereby a bottle carrier head on each end of the arm may be stopped successively at said pick-up and loading stations to collect, transfer and deposit the bottles or the like carried on each head.

Each bottle carrier head comprises a frame which is additionally movable in a vertical plane whereby bottles etc. carried thereon may be raised or lowered and whereby inflatible inserts mounted on the underside of each head may be inserted into and/or withdrawn from the open neck portion of bottles, jars or like articles. The inserts are inflated by air pressure after insertion in the neck portions of the bottles or the like whereby the walls of the inserts grip firmly the inside neck portions thus providing a carrying member for the bottles or the like. When the bottles or the like are lowered into a packing case at the loading station the inserts on the carrier head at that station are evacuated to release the bottles whilst the inserts on the carrier head on the other end of the pivotal arm, i.e. at the pick-up station, are inflated to grip the bottles.

3,780,493

PACKAGE CAPPING APPARATUS

Leroy D. Baker, Morris, Ill., assignor to Diamond International Corporation, New York, N.Y.

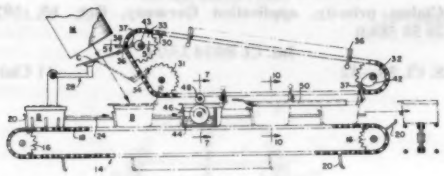
Filed Nov. 15, 1971, Ser. No. 198,866

Int. Cl. B65b *7/28*

U.S. Cl. 53—287 **18 Claims**

Apparatus for continuously forming produce packages for marketing comprising support means upon which containers filled with produce are individually fed and moved, conveyor means for moving each container to successive areas of opera-

tion to form a completed package, said areas including cap supply source, cap dispensing means, means for gripping and moving each cap in timed relationship along with the produce container, means for applying glue to lateral tab portions of each cap, means for folding the lateral portions of the cap against adjacent sides of the container associated therewith,



means for compressing the lateral portions of the cap firmly against the sides of the container, means for applying glue to leading and trailing tab portions of the cap, means for folding the leading and trailing tab portions of the cap against adjacent sides of the container and means for compressing the leading and trailing tab portions of the cap firmly against the sides of the containers.

3,780,494

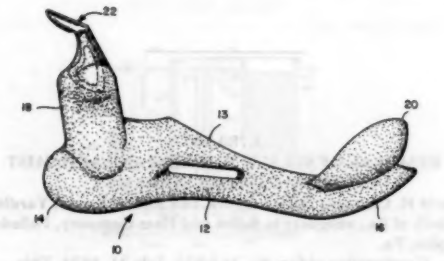
MOLDED SADDLE TREE AND METALLIC SADDLE HORN

Erby Roy Nankivell, Jr., Athens, Tenn., assignor to Ralide, Inc., Athens, Tenn.

Continuation-in-part of Ser. No. 172,208, Aug. 16, 1971, Pat. No. 3,712,024, which is a continuation-in-part of Ser. No. 730,874, May 21, 1968, abandoned, and a continuation of Ser. No. 822,907, May 8, 1967, abandoned. This application Jan. 12, 1973, Ser. No. 323,333

Int. Cl. B68c *01/02*

U.S. Cl. 54—44 **3 Claims**



A molded saddle tree assemblage is provided by forming a seat, front and rear jockeys, a cantle, pommel and a ground seat by injection molding the tree assemblage in a mold cavity within which a metallic saddle horn is positioned for attachment to the molded tree as it is molded with the base or stem portion of the horn shaped for maximum embedded strength.

3,780,495

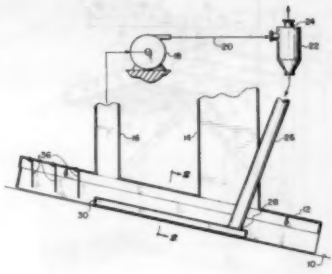
METHOD AND APPARATUS FOR CONTROLLING DUST

Charles E. Johanningmeier, Carlsbad, N. Mex., assignor to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed May 1, 1972, Ser. No. 249,356

Int. Cl. B01d *45/12*

U.S. Cl. 55—1 **6 Claims**



A method and apparatus is disclosed for controlling dust in the handling of dusty particulate material by belt conveyor. Dust-laden air generated by the deposit of dusty material on a belt conveyor is gathered by a fan and hood system enveloping the locus where the material is dropped on the conveyor. The dust-laden air is separated into a dust fraction and an air fraction and the dust fraction is returned to the conveyor through a downwardly extending pipe which communicates with a tunnel-shaped shoe just above the conveyor belt. The shoe is located such that it is completely enclosed by the particulate material deposited on the conveyor.

3,780,496

SULFONATED POLYXYLENE OXIDE AS A PERMSELECTIVE MEMBRANE FOR GAS SEPARATIONS

William J. Ward, III, and Robert M. Salemme, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 31, 1972, Ser. No. 276,753

Int. Cl. B01d *53/22*

U.S. Cl. 55—16 **7 Claims**

Sulfonated polyxylylene oxide membranes are very effective for the separation of helium, hydrogen and oxygen from gas mixtures. The discovery that the permeability of the aforementioned gases varies with the counter ion form of the sulfonated polyxylylene oxide membrane used is also disclosed.

3,780,497

ADSORPTION OF FLUORINE AND FLUORINE COMPOUNDS ON ALUMINA

Wolf Muhlrad, Chatou, France, assignor to Air Industrie, Courbevoie, France

Filed Aug. 20, 1971, Ser. No. 173,475

Claims priority, application France, May 28, 1971, 71.19494

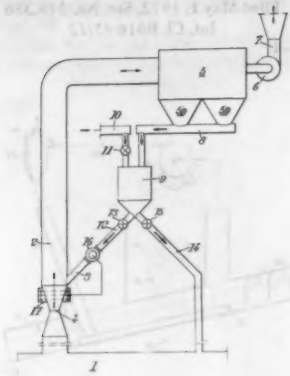
Int. Cl. B01d *53/06*

U.S. Cl. 55—71 **10 Claims**

The invention relates to a method for adsorbing gaseous fluorine on alumina particles.

The alumina particles are introduced at the base of an adsorption column through which the stream of gas to be

scrubbed flows, the column terminating in a separator where the particles charged with fluorine are recovered. The method



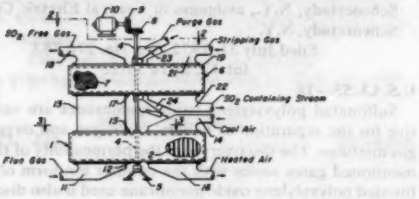
is particularly suitable for scrubbing of gas from electrolytic baths in an aluminium-producing plant.

3,780,498

SULFUR OXIDES REMOVAL SYSTEM

John G. Wenner, Lincolnshire, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 31, 1972, Ser. No. 239,893
Int. Cl. B01d *53/06*; **F23i** *15/02*
U.S. Cl. 55—73 **8 Claims**



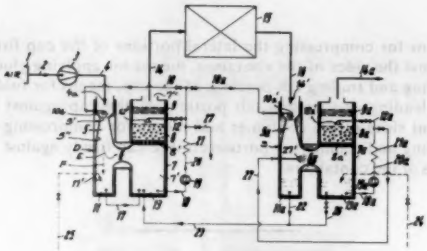
A continuous system is provided for effecting the removal of sulfur oxides from a waste gas stream through the utilization of continuously rotating an acceptor unit, that has a plurality of segmented zones containing an SO_2 adsorbent acceptor material, such that at least one segmental zone is always being rotated into the pathway of an SO_2 containing waste gas stream while at least one other contacted zone is simultaneously being passed through and into contact with a regeneration stream so as to undergo the removal of sulfur oxides. A special embodiment of the system utilizes two stages of rotating beds or units, whereby a first contacted rotating unit serves as a heat exchanger to recover useful heat from the waste gas stream and the second stage rotating unit serves to effect sulfur oxides removal.

3,780,499

SYSTEM FOR THE LIQUID-PHASE REMOVAL OF A COMPONENT FROM THE GAS STREAM ESPECIALLY THE ABSORPTION OF SULFUR TRIOXIDE IN SULFURIC ACID

Karl-Heinz Dorr, Mainz; Hugo Grimm, Frankfurt am Main, and Rolf Kola, Homberg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 12, 1971, Ser. No. 188,127
Claims priority, application Germany, Oct. 15, 1970, P 20 50 580.0
Int. Cl. B01d *53/14*
U.S. Cl. 55—32 **11 Claims**



A process for the removal of gaseous components from a gas stream by liquid-phase absorption of the component in the treatment of the gas with a liquid, especially the absorption of sulfur trioxide from a gas stream obtained by the contact-catalysis oxidation of sulfur dioxide in the production of sulfuric acid, makes use of a uniflow vertical venturi absorber followed by a turbulencing device or horizontal venturi absorber and a counterflow column absorber or tower. The absorbing liquid is sulfuric acid.

3,780,500

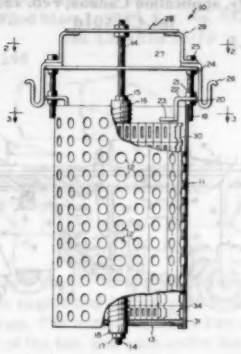
REMOVAL OF SULFUR TRIOXIDE AND ACID MIST FROM GASEOUS STREAMS

David H. Clemens, Willow Grove, and Robert Kunin, Yardley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 164,932, July 21, 1971. This application Feb. 15, 1973, Ser. No. 332,836
Int. Cl. B01d *53/00*
U.S. Cl. 55—73 **16 Claims**

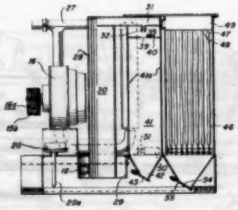
Sulfur trioxide $(SO)_3$ and/or sulfuric acid mist are removed from the gaseous effluents, particularly those from sulfuric acid plants, by contacting the gas containing such components with a crosslinked, macroreticular, polymeric ion exchange resin containing a vinylpyridine moiety. The resin is a macroreticular weak base resin which can be regenerated with an alkaline material.

3,780,501
GETTER PUMPS
Paolo Della Porta; Mario Zucchinelli, both of Milan, and Cesare Pisani, Turin, all of Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy
Continuation of Ser. No. 761,161, Sept. 20, 1968, abandoned. This application Nov. 11, 1971, Ser. No. 197,819
Claims priority, application Italy, Aug. 10, 1968, 20046 A/68
Int. Cl. B01d *53/04*
U.S. Cl. 55—208 14 Claims



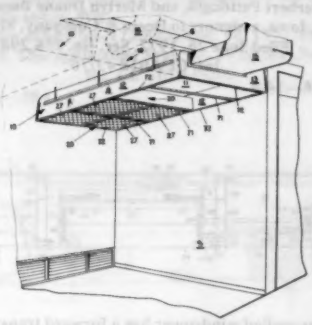
A getter pump comprising a circular pleated strip of metal having a non-vaporative getter material attached to its surface and a heater coaxially disposed within said circular strip.

3,780,502
COLLECTOR APPARATUS
George T. Dupre, Palatine, and Thomas M. DeMarco, Chicago, both of Ill., assignors to National Foundry Equipment Company, Inc., Palatine, Ill.
Continuation of Ser. No. 109,246, Jan. 25, 1971, abandoned. This application Jan. 12, 1973, Ser. No. 323,085
Int. Cl. B01d *50/00*
U.S. Cl. 55—337 11 Claims



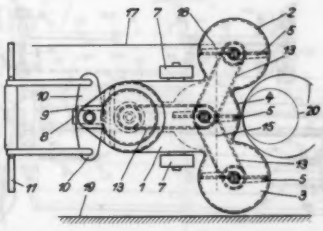
An industrial heavy-duty vacuum collector suitable for use with waste material hoppers, particularly dump hoppers. The collector includes a positive displacement vacuum blower apparatus, a material separator apparatus on a base mountable in airtight relation with the hoppers and an automatic control apparatus for the collector.

3,780,503
LOW PROFILE FILTER SYSTEM
Irwin M. Smith, Grand Rapids, Mich., assignor to Walter Kidde & Company, Inc., Grand Rapids, Mich.
Filed Dec. 27, 1971, Ser. No. 212,264
Int. Cl. B01d *31/00*
U.S. Cl. 55—418 22 Claims



A plurality of large plenum chambers are provided for hanging from the ceiling of a room. Each supports four low profile filter units. Each filter unit includes a frame, circumscribing a filter which is mounted in the frame, and a sliding plate air flow control valve mounted above the frame. The air flow control valve has a flow control area which is generally coextensive with the area of the filter. A seal is effectuated between the frame and the plenum chamber by means of a sealing flange projecting upwardly from the strips supporting the filter units into a channel at the bottom edge of the frame. The channel is covered by a flexible membrane which is stretched over the top of the sealing flange. The plenums are suspended and joined together by a supension wire passing through matingly engaging joining brackets on adjacent plenum chambers.

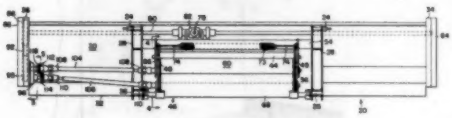
3,780,504
LAWN MOWER
Fritz Haseloff, Behingstrasse 3, Kassel, Germany
Filed Mar. 20, 1972, Ser. No. 236,147
Claims priority, application Germany, Mar. 29, 1971, P 21 15 101.9
Int. Cl. A01d *55/26*
U.S. Cl. 56—13.6 5 Claims



A rotary-type lawn mower having a housing and three cutter heads, each of which includes a blade mounted to rotate about a vertical axis, are mounted in triangular relation within the housing. One of the cutter heads is located along the longitudinal center line of the housing while the other cutter heads are located forwardly and laterally outward of the central cutter head. Wheels are mounted on opposite sides of the

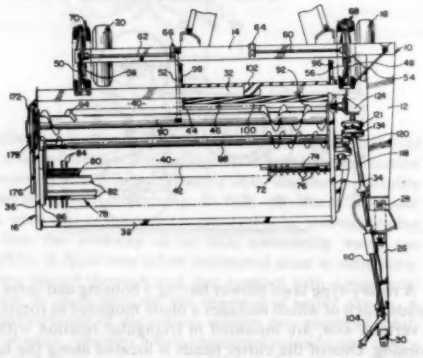
housing and the wheels are positioned so that the cutting zone of each forward cutter head is located a substantial distance ahead and laterally outward of the respective wheel. A third pivotable wheel is attached to the rear end of the housing to said in steering.

3,780,505
CROP CONDITIONER DRIVE
Donald Herbert Pettengill, and Merlyn Duane Bass, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.
Filed June 26, 1972, Ser. No. 266,298
Int. Cl. A01d *43/10*
U.S. Cl. 56—14.4 **7 Claims**



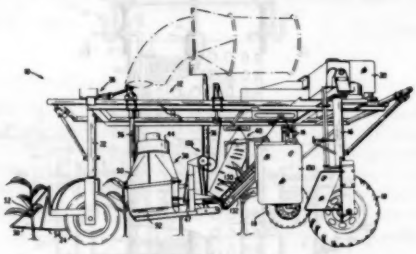
A self-propelled windrower has a forward transversely elongated auger-type platform with a central crop discharge opening, and a crop conditioning unit is mounted on the rear wall of the platform and conditions the crop as it moves through the discharge opening. The crop conditioner unit includes a pair of transverse conditioner rolls, which condition the crop as it passes between the rolls, the upper roll being journaled on a pair of vertically swingable arms to vary the clearance between the rolls. A header drive shaft extends forwardly from the propulsion unit and drives a transverse drive shaft, which is mounted on and spans the width of the rear wall of the platform. One end of the transverse drive shaft is connected by a belt drive to the input shaft of a gearbox mounted on the side of the platform, and the gearbox has two output shafts rotating in opposite directions and respectively connected to the upper and lower conditioner rolls by means of transverse drive shafts, which are provided with universal joints and are disposed adjacent to the rear wall of the platform.

3,780,506
HARVESTER DRIVE SYSTEM
Donald K. Tashiro, Hamilton, Ontario, Canada, assignor to International Harvester Company, Chicago, Ill.
Filed Aug. 1, 1972, Ser. No. 276,984
Int. Cl. A01d *45/02*
U.S. Cl. 56—14.5 **9 Claims**



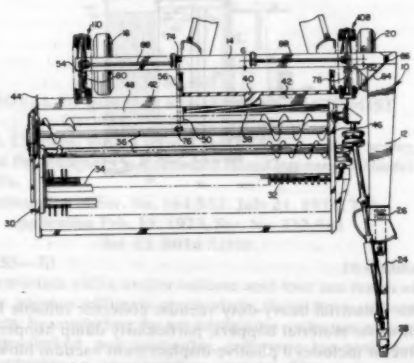
A pull-type windrower having a crop harvesting platform floatably mounted on a wheeled frame adapted to be coupled behind a tractor. The platform includes a cutter, a reel, a pair of crop-conveying augers, and a pair of crop conditioning rolls for cutting a standing crop, consolidating and conditioning the same, and depositing the crop onto the ground in a windrow. The windrower includes a power drive system for driving the above-mentioned components from the power takeoff (PTO) drive of the tractor.

3,780,507
TOBACCO HARVESTER
Leonard A. Chapman, London, Ontario, Canada, assignor to Eagle Machine Company Limited, London, Ontario, Canada
Filed July 6, 1970, Ser. No. 52,345
Claims priority, application Canada, Feb. 25, 1970, 075838
Int. Cl. A01d
U.S. Cl. 56—27.5 **25 Claims**



Improved apparatus for harvesting growing tobacco leaves from a standing tobacco crop is described. The harvester includes means for orienting the tobacco leaves and maintaining such orientation during and after defoliation until deposition of the leaves in container means provided on the harvester. Improved leaf defoliator elements are provided and devices for separating leaves in the picking swath from those above the picking swath are provided. The harvester is designed such as to reduce leaf damage to a minimum. The harvester also includes improved means for effecting directional control thereof relative to the tobacco plants to still further reduce damage to the tobacco leaves.

3,780,508
HARVESTER PLATFORM SUSPENSION
Donald K. Tashiro, Hamilton, Ontario, Canada, assignor to International Harvester Company, Chicago, Ill.
Filed Aug. 1, 1972, Ser. No. 277,030
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **10 Claims**



A windrower including a wheeled frame adapted to be towed behind a tractor and having a harvester platform on the

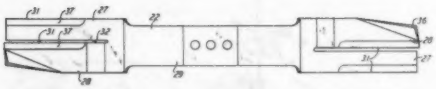
frame for cutting a crop and depositing the crop unto the ground in a windrow. The platform is mounted on the frame by arm means and is moveable vertically by hydraulic lift cylinders. The platform is suspended by a pair of spring units and a pair of torsion bar assemblies which cooperate to floatably support the platform for movement relative to the frame as dictated by varying contour of the ground over which the windrower is moved.

3,780,509

ROTARY LAWN MOWER CUTTER BAR WITH BI-LEVEL CUTTER

Neill C. Woelffer, Racine, Wis., assignor to Jacobson Manufacturing Company, Racine, Wis.

Filed Mar. 2, 1973, Ser. No. 337,661
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **6 Claims**



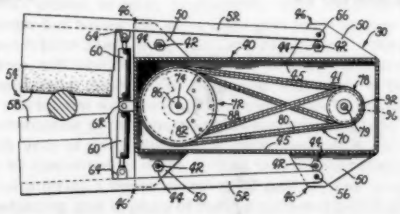
A rotary lawn mower having an engine and a cutter bar rotated by the engine and having a grass catcher bag for collecting the grass. The cutter bar has a pair of cutters on each opposite end of the bar, and each cutter has a cutting edge on the rotationally leading side of the cutter. The cutters are both vertically and horizontally offset within their pairs, and the upper one of the cutters in each pair is rotationally in advance of the other one of the cutters so that the leading and upper cutter will cut the grass prior to being cut by the trailing and lower cutter, and thus each blade of grass is cut into two short lengths by the bilevel cutter. An air-fanning blade is also included in the cutter bar and creates a flow of air to convey the clippings from the cutter bar and through the outlet of the mower and into the collector bag.

3,780,510

SHAKER HEAD

Neil R. Tompkins, Yuba City, Calif., assignor to Halsey Harvester & Supply Co., Inc., Colusa, Calif.

Filed Jan. 31, 1972, Ser. No. 221,893
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 TS **4 Claims**



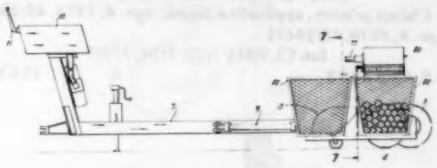
A mechanical shaker head particularly suited for use in dislodging tree-borne objects such as fruits and nuts. The shaker head is characterized by a frame pivotally coupled to the distal end of a transportable boom and having supported therein a carriage from which is extended an operable clamp for grasping a selected portion of a given tree, and force generating means characterized by a pair of counter-rotating masses driven at a common tangential velocity, about a common axis of rotation, and at different angular velocities for periodically applying radially directed shock to the carriage through 360° of stepped progression, so that a vibratory motion is transmitted to components of the given tree, whereby the tree-borne objects are dislodged in response to the vibratory motion imparted to the shaker head by the force generating means.

3,780,511

TRASH SEPARATOR FOR CROP PICK-UP HARVESTER

John M. Avis, Spring Lake, Mich., assignor to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 172,623, Aug. 18, 1971, Pat. No. 3,712,039. This application Sept. 15, 1972, Ser. No. 289,671
Int. Cl. A01d *89/00*
U.S. Cl. 56—364 **4 Claims**



A trash separator for a mobile harvester for picking up fruit such as apples, oranges, nuts or vegetables for example, lying on the ground, which separator acts to separate trash from the crop and which additionally acts to clean the crop before discharging it into storage bins or the like. The separator includes pairs of oppositely rotating rollers which pull the foreign material downwardly through the nip formed between the pairs of rollers. The rollers are driven by a fluid motor through a flexible chain and the separating unit in general is inclined downwardly to cause the crop material to move thereover by gravity. Flexible means are provided in the form of curtains to impede the passage of the crop and trash over the rollers thereby insuring good separation. The rearward porton of the rollers are formed as brushes so as to insure cleaniness of the crop before discharge from the separator.

3,780,512

PROCESS AND DEVICE FOR PRODUCING FANCY PLY YARNS WITH HIGH EFFICIENCY UPTWISTERS

Michele Ratti, via Fascara 5, Luino, Italy

Filed Jan. 26, 1972, Ser. No. 220,820
Claims priority, application Italy, Feb. 10, 1971, 20404/71
Int. Cl. D02g *3/34*
U.S. Cl. 57—16 **5 Claims**

Fancy yarns are produced by twisting a core yarn in one direction, and then winding an effect yarn in the opposite

direction about the core yarn while simultaneously varying the velocity of the core yarn so as to group the turns of effect yarn on the core yarn. A plurality of oppositely wound effect yarns can be applied. The direction of twist of each yarn remains unchanged throughout.

3,780,513

METHOD AND APPARATUS FOR DRIVING OPEN-END SPINNING FRAME

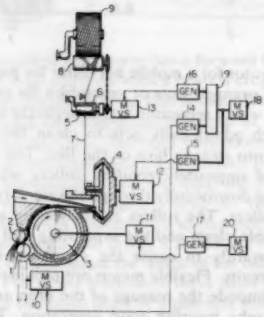
Kazuo Watanabe, Bisai; Yastami Kito, Nagoya; Choji Nozaki, Nagoya; Kiichi Kono, Nagoya; Kanemitsu Tsuzuki, Kariya, and Kozo Motobayashi, Aichi-ken, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken and Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Apr. 5, 1971, Ser. No. 131,086

Claims priority, application Japan, Apr. 8, 1970, 45/29431; Apr. 8, 1970, 45/29432

Int. Cl. D01h *1/12, 1/34, 15/00*

U.S. Cl. 57—93 **15 Claims**



Method and apparatus for driving open-end spinning frame by a first electric source which actuates the spinning frame at a predetermined higher speed for carrying out the normal spinning operation and by a second electric source which actuates a spinning unit of yarn break at a predetermined lower speed during the yarn piecing operation. These electric sources are variable frequency electric sources for driving at least each individual variable speed motor which is directly connected to a spinning rotor of each spinning unit at predetermined variable speed.

3,780,514

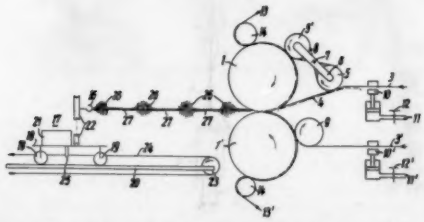
METHOD FOR THE MANUFACTURE OF WREATHS, POMPONS, ROSETTES, AND THE LIKE

Gerd Rodermund, Inder Breite 24, and Helmut Kappus, both of Lahr, Germany, assignors to said Rodermund, by said Kappus

Filed Feb. 9, 1968, Ser. No. 704,462

Int. Cl. D04d *1/00, 7/00*

U.S. Cl. 57—156 **7 Claims**



A method and apparatus for manufacturing wreaths, pompons, rosettes and the like by utilizing a pair of rotating cutting and counter rolls each of which is provided with a peripheral groove at the passage of twistable wires for at least one strip which runs between the rolls and a take-off and twisting device. The strip is fed at a velocity which is substantially greater than the take-off speed of the twisted wires.

3,780,515

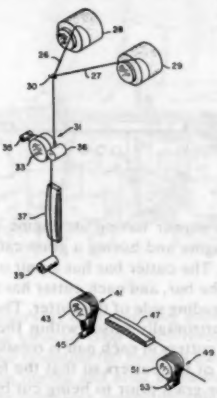
TEXTURED CORE YARNS

Graham Thomas Waters, Caerleon, Wales, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 125,683, March 18, 1972, Pat. No. 3,691,750, which is a continuation-in-part of Ser. No. 805,598, March 10, 1969, Pat. No. 3,577,873. This application June 8, 1972, Ser. No. 260,934

Int. Cl. D02g *3/38, 3/04, 3/28*

U.S. Cl. 57—157 R **5 Claims**



False twist textured yarns are described which are composed of a plurality of continuous filaments forming a false twist textured core portion and a plurality of wrapper false twist textured continuous filaments, said wrapper filaments being of a higher bulk than the core filaments, said filaments periodically wrapping around the core filaments and forming reversing helices at intervals along the yarn.

3,780,516

PROCESS FOR FORMING YARN OF IMPROVED PROPERTIES

William C. Kimbrell, Blacksburg, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1972, Ser. No. 282,934

Int. Cl. D02j *1/22*

U.S. Cl. 57—157 TS **3 Claims**

In a process for forming yarn wherein a plurality of yarn ends pass from their respective yarn packages, are each

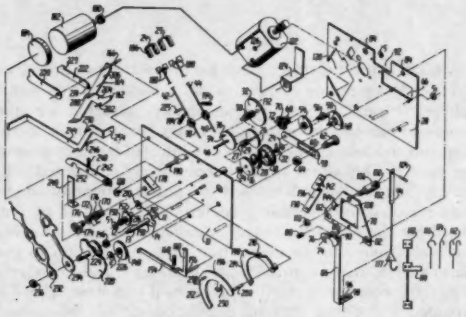
wrapped about a common feed roll, pass from the feed roll through a heating zone, pass from the heating zone to a common heated draw roll, are wrapped about the heated draw roll, and pass from the heated draw roll through apparatus for bringing the yarn ends into contact with one another in a preselected arrangement to form a resultant yarn, said resultant yarn is caused to have improved properties by wrapping a selected one of the yarn ends about the heated draw roll a number of turns, said number of turns being greater than the common number of turns the other yarn ends are wrapped about said draw roll.

3,780,517

CHIME BATTERY CLOCK WITH ADJUSTING WHEEL FOR ADJUSTING THE MOVEMENT THEREOF

Mamut Ajrulahi, 7308 Parkwood Ct., Falls Church, Va.

Filed Nov. 7, 1972, Ser. No. 304,478
Int. Cl. G04b *13/00*
U.S. Cl. 58—7 **9 Claims**



A chime battery clock having an adjustable movement which can alter a basic movement to another desired movement, including an adjusting gear secured to an adjusting base which is slidably and rotatably securd to a front plate housing the movement. A conventional third gear engages a pinion of the adjusting gear while the adjusting gear engages a pinion of an escape wheel. Replacement of either the escape wheel pinion, the adjusting gear pinion, or the adjusting gear with another pinion or gear, respectively, of a different size in diameter but having the same sized gear teeth so as to insure proper intermeshing of the gear, and adjustment of the adjusting base, will alter the movement and facilitate achievement of the movement desired. The movement may serve as the basis of a clock from which other movements may be obtained, or by substitution of the adjusting gear and adjusting base for the fourth gear of an existing clock movement, such movement may be converted to other desired movements. Similarly, in lieu of utilizing a conventional third gear, as well as utilizing the adjusting gear in place of the conventional fourth gear, the adjusting gear may be employed in place of the conventional third gear, while a conventional fourth gear is used.

In addition, the clock movement has only a single chime gear, and when converting non-chime clocks to chime clocks, only the single chime gear need be incorporated within the movement.

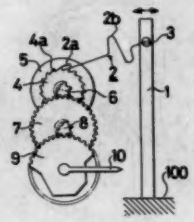
Furthermore, although the clock movement of the present invention is disclosed as being battery-powered, other sources of power may be utilized, such as, for example, an electric motor, a hand crank key mechanism, a hand-wound chain mechanism, or the like.

3,780,518

MOTION CONVERTER

Yoshiaki Kato, 20-46, 4-chome, Higiyama-cho, Higashimuraya-shi, Tokyo, and Hiroshi Mabuchi, 873, Shimotomi Takeno, Tokorozawa-shi, both of Japan

Filed July 14, 1971, Ser. No. 162,360
Claims priority, application Japan, May 26, 1971, 46-36081
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 D **5 Claims**



This invention relates to a motion converter for converting the oscillating movement of a mechanical vibrator.

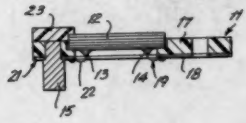
The motion converter according to this invention is characterized by that the feed pawl is designed to have a substantial resiliency in its oscillating direction and the ratchet wheel has a substantial moment of inertia, said pawl resiliency and said ratchet inertia serving in combination for converting otherwise stepwise intermittent movement of said ratchet wheel into a substantially continuous and constant rotation thereof.

3,780,519

TIMEPIECE DIAL WITH ELECTRICALLY CONDUCTING FOOT

Ikuo Tokunaga, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan

Filed Dec. 23, 1971, Ser. No. 211,501
Claims priority, application Japan, Dec. 29, 1970, 45/141705
Int. Cl. G04c *3/00*; G04b *19/06*
U.S. Cl. 58—23 C **6 Claims**

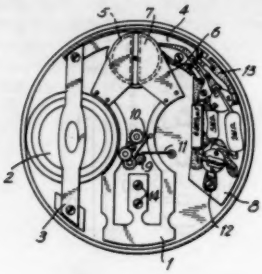


In a timepiece driven by a cell which is charged by a solar battery,connection is made between the solar battery which is mounted in the dial and the cell which is interior to the timepiece by means of at least one electrically conducting foot which is part of the dial. The electrically conducting foot may be so constructed that it serves to connect one terminal of the solar battery to the cell or both terminals of the solar battery to the cell. A similar foot may be used for connecting the cell to other electrical components of said timepiece.

3,780,520
WATCH HAVING TUNING FORK TIME STANDARD

Yuki Tsuruishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan

Filed Feb. 2, 1972, Ser. No. 222,956
Claims priority, application Japan, Feb. 12, 1971, 46/5577
Int. Cl. G04c 3/00
U.S. Cl. 58—23 TF 3 Claims

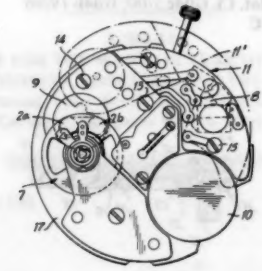


A watch having a tuning fork vibrating at an audio frequency as a time standard is provided with means for converting the vibratory movement of the tuning fork into the rotary movement of a gear train and a driving circuit for sustaining the vibratory movement of the tuning fork. The driving circuit includes a battery, a two-terminal coil cooperating with a magnetic circuit on said tuning fork, a PNP transistor and an NPN transistor, the two-terminal coil being connected between the collector electrodes of said transistors.

3,780,521
ELECTRONIC TIMEPIECE

Masahiro Kurita, Suwa, and Tomio Ota, Okaya, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 6, 1971, Ser. No. 206,227
Claims priority, application Japan, Dec. 4, 1970, 45/120242; Dec. 28, 1970, 45/132714
Int. Cl. G04c 3/04; G04b 17/00
U.S. Cl. 58—28 A 1 Claim

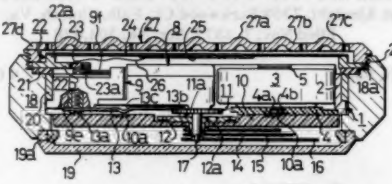


An electronic timepiece having a magnetic circuit including permanent magnets mounted on an oscillator, said magnetic circuit including an air gap. A driving and controlling device including at least one coil is pivotably mounted in said timepiece for displacement in a plane extending substantially parallel to the oscillating direction of said oscillator between an operative position at which said coil is positioned in said air gap and an inoperative position at which said driving and controlling device is positioned out of overlapping relation with said oscillator. The oscillator may take the form of a balance wheel assembly formed of a pair of spaced balance wheels mounted in spaced relation on a common arbor, one of said balance wheels being formed of a magnetic material, the other of said balance wheels being formed of a non-magnetic material.

3,780,522
ALARM TIMEPIECE

Makoto Yoshida, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed May 22, 1972, Ser. No. 255,819
Claims priority, application Japan, June 5, 1971, 46/47337
Int. Cl. G04c 21/34; G04b 23/12
U.S. Cl. 58—38 4 Claims

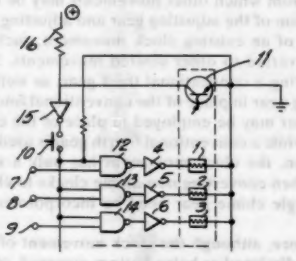


A small alarm timepiece having a timepiece movement, an electrically operating buzzer as an acoustic alarm signal delivery means, a battery detachably mounted on the timepiece movement for energizing said buzzer for its operation, and an alarm switch for on-off control of the operation of the buzzer. This alarm switch is operatively connected with the movement so as to be closed at a preset time point and to remain closed for a certain predetermined operation period. The drive circuit for the buzzer is designed as a free-running oscillator having an oscillator transistor. In addition to the alarm switch, there is provided a switching transistor operatively connected with the first mentioned transistor. There is provided a CR-time limiting circuit operatively connected with the switching transistor for control thereof. In this way, the operating period of the buzzer is limited to only a small fraction of the closure period of the alarm switch which is adapted for being mechanically closed at the preset time by the action of an alarm control mechanism fitted to the timepiece movement. In this way, the power consumption of the electronic alarm can be minimized.

3,780,523
WATCHES HAVING LIQUID CRYSTAL DISPLAYS

Okito Naito, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 2, 1972, Ser. No. 222,742
Claims priority, application Japan, Feb. 10, 1971, 46/5217
Int. Cl. G04b 19/30
U.S. Cl. 58—50 R 3 Claims



A watch having a liquid crystal display for the digital display of time in response to timing signals produced by divider and

driving circuits, which in turn produce said timing signals in response to the high frequency time standard signal of a quartz crystal oscillator. A switch means is coupled to said driving circuits for rendering said liquid crystal display inoperative without disturbing said oscillator and divider circuit.

3,780,524

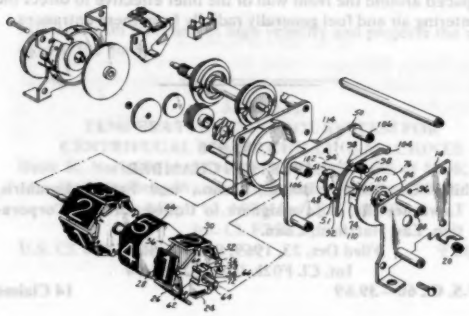
DIGITAL DISPLAY INDICATOR

Robert L. Boyles, Wayland, Mass., assignor to General Electric Company, Bridgeport, Conn.

Filed Mar. 8, 1973, Ser. No. 339,419

Int. Cl. G04b *19/02*

U.S. Cl. 58—125 C **9 Claims**



A digital display indicator wherein a plurality of numerals are carried on a rotatable drum 38 so that the numerals may be successively brought into position behind a viewing window 52. An eccentrically mounted drive finger 74 accurately indexes a ratchet wheel of the rotatable drum from one position to a next succeeding position while the finger holds a spring loaded detent lever away from the ratchet wheel.

3,780,525

SETTING MEANS FOR INDICATING APPARATUS

Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

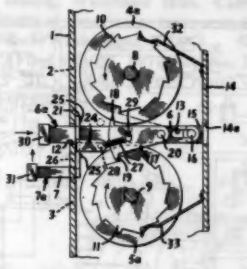
Filed Mar. 28, 1973, Ser. No. 345,736

Claims priority, application Japan, Mar. 28, 1972, 47/31076

Int. Cl. G04b

U.S. Cl. 58—125 C **12 Claims**

Setting means for digital indicating apparatus, for example a digital clock having a plurality of coaxial indicating display wheels and a like plurality of coaxial reference display wheels, comprises a rachet wheel fixed on each of said display wheels and a single reciprocable setting member located between each of the indicating display wheels and the corresponding reference display wheel. A pawl pivotally mounted on the setting member is movable between a first position in which it is engageable with the rachet wheel of the respective indicating display wheel and a second position in which it is engageable with the rachet wheel of the corresponding reference display wheel. The pawl is shifted from one position to the other by manually operable changeover means so that the same setting member is operable to rotate either the indicating display wheel or the corresponding reference display wheel to the desired setting.



3,780,526

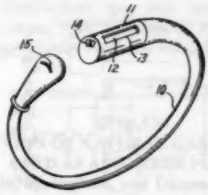
TIMEPIECE INCLUDING A COLOR CYLINDER AND ANOTHER TIME INDICATOR DISPLAYED ON A DIFFERENT PLANE

Marilyn J. Maue, 20 Melwex St., Belleville, N.J.

Continuation-in-part of Ser. No. 696,940, Jan. 10, 1968, Pat. No. 3,616,643. This application July 30, 1971, Ser. No. 167,778

Int. Cl. G04b *19/00*

U.S. Cl. 58—126 R **9 Claims**



A timepiece is provided, particularly at the free end of a bracelet body, by having the bracelet body terminate in a cylindrical color carrying member which, in turn, is adjacent a numerical or other display indicator at its free end for viewing in a direction which is generally axial of, or angled to the axis of the cylindrical color carrying member.

3,780,527

CONTROL APPARATUS FOR A GAS TURBINE ENGINE

Geoffrey Arthur Lewis, Olton, Solihull, Warwickshire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

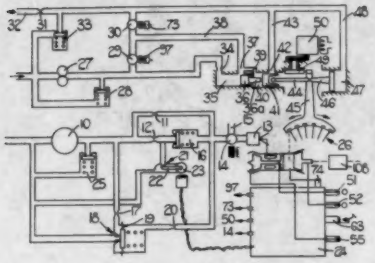
Filed Apr. 21, 1971, Ser. No. 136,150

Int. Cl. F02c *3/10, 9/04*

U.S. Cl. 60—39.16 R **21 Claims**

A control apparatus for a gas turbine having a separate gas generator and power turbine and nozzles for controlling the passage of gas to the power turbine, includes valves responsive

to electrical signals to derive servo pressures to actuate the nozzles, the said electrical signals being generated in response



to engine operating conditions and also providing an input to an electric actuator which can modify the nozzle position.

3,780,528

THERMODYNAMIC RECIPROCATING MACHINE WITH CONTROLLED FUEL/AIR SUPPLY

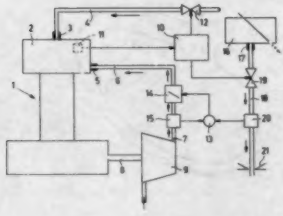
Klaus Brandenburg, Kirchen-Wehbach, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1972, Ser. No. 226,913

Claims priority, application Netherlands, Mar. 4, 1971, 7102862

Int. Cl. F02g *3/02*

U.S. Cl. 60—39.27 **5 Claims**



A thermodynamic reciprocating engine in combination with a carburetor having inlets and control apparatus responsive to air and fuel flow for providing optimum operation.

3,780,529

COMBUSTION APPARATUS

Douglas Johnson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

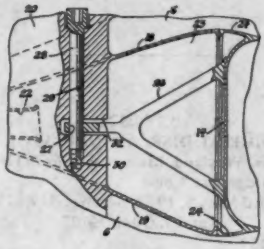
Division of Ser. No. 169,307, Aug. 5, 1971, Pat. No. 3,724,207.

This application Nov. 21, 1972, Ser. No. 308,524

Int. Cl. F02c *7/20*

U.S. Cl. 60—39.36 **3 Claims**

A combustion apparatus having outer and inner casing walls and an annular combustion liner mounted between them. The combustion liner is supported at its upstream end by brackets extending from the front wall of the liner having a radial slip fit connection with struts connecting the outer and inner casings. An annular diffuser fitting against the front end of the combustion liner and extending from and between the struts supplies air to the front wall of the combustion liner. Fuel is introduced through combined fuel and air inlet structures spaced around the front wall of the liner effective to direct the entering air and fuel generally radially from these entrances.



3,780,530

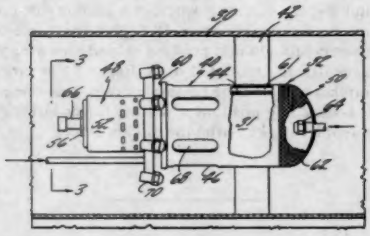
COMBUSTION CHAMBER

Philip G. Dooley, Bolton, Conn., and Sotiris Lambiris, Lawrenceville, N.J., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 23, 1969, Ser. No. 868,677

Int. Cl. F02k *3/04*; F23r *1/04*

U.S. Cl. 60—39.69 **14 Claims**



A combustion chamber or duct heater which provides an enclosed volume where partial combustion occurs and a transverse momentum is imparted to the burning gases to obtain mixing and burning with a secondary fuel supply.

3,780,531

HYDROTURBINE

William G. Blair, Bolusia, Fla., assignor to Blair Engineering, Inc., Ormond Beach, Fla.

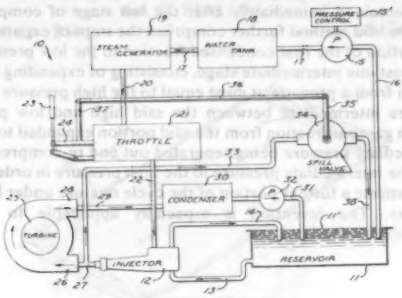
Filed Apr. 23, 1971, Ser. No. 136,721

Int. Cl. F01k *25/04, 13/00*

U.S. Cl. 60—40 **2 Claims**

There is disclosed herein a hydroturbine apparatus in which

a rotary engine or turbine having radially disposed blades is driven by an injector of the type which entrains water in pressurized steam traveling at high velocity and projects the same against the blades.

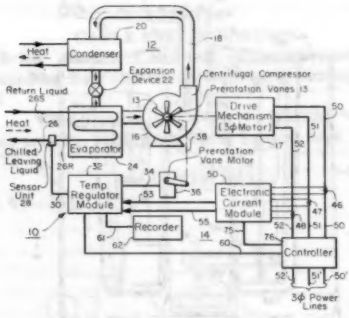


3,780,532

TEMPERATURE CONTROL SYSTEM FOR CENTRIFUGAL LIQUID CHILLING MACHINES

Dean K. Norbeck, and Francis A. Kimpel, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 17, 1971, Ser. No. 181,507
Int. Cl. F25b 1/00
U.S. Cl. 62—201 **9 Claims**



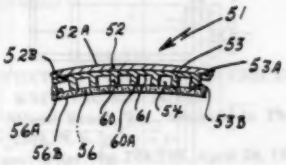
An improved temperature control system for centrifugal compressors in refrigeration equipment for elimination of "droop" associated with proportional position control is disclosed using a two thermistor temperature sensing unit for sensing both the temperature and the rate and direction of change of the temperature of the chilled liquid from the evaporator and for producing a change in the pre-rotation vane setting. The rate and direction of change of temperature is obtained by comparing a fast and a slow temperature signal in a summing amplifier to control a pulse width modulator that modulates a sawtooth generator to control a vane motor through appropriate logic. The fast temperature signal is also compared with a unit cycling thermostat reference signal in a Schmitt Trigger to de-energize the compressor when that temperature signal reaches the reference level. The fast temperature signal is also used to drive a recorder.

3,780,533

COMPOSITE WALL FOR A REGENERATIVELY COOLED THRUST CHAMBER OF A LIQUID PROPELLANT ROCKET ENGINE

David H. Huang, Woodland Hills, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 17, 1972, Ser. No. 254,139
Int. Cl. F02k 1/02
U.S. Cl. 60—260 **4 Claims**



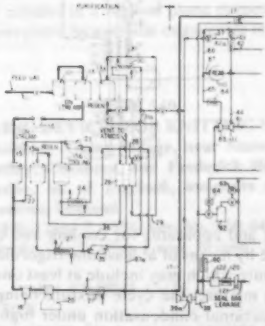
A composite wall, and a method of manufacturing it, for a regeneratively cooled thrust chamber of a liquid propellant rocket engine. The composite wall of the thrust chamber comprises: an outer wall component of high strength lightweight alloy; a middle wall component of nickel abutting with and joined to the outer wall component, with the middle wall having a plurality of lands thereon and a plurality of grooves therein; and, an inner wall component of material of high thermal conductivity and high temperature strength and ductility, with the inner wall component abutting with and joined to the lands on the middle wall component, thereby forming liquid propellant coolant passages of the channel type. The outer wall component, the middle wall component, and the inner wall component are integrated to form a unitary structure. The external surface of the outer wall component functions as the external structural shell surface of the thrust chamber, and the internal surface of the inner wall component functions as the internal combustion gas side surface of the thrust chamber. The inner wall component may be conveniently, easily, and economically replaced after its normal operational life.

3,780,534

LIQUEFACTION OF NATURAL GAS WITH PRODUCT USED AS ABSORBER PURGE

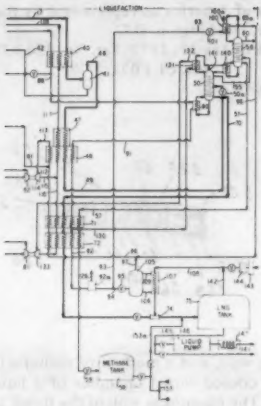
Antony Lofredo, Springfield, and Domenick R. Biava, Somerset, both of N.J., assignors to Airco, Inc., New York, N.Y.

Filed July 22, 1969, Ser. No. 843,427
Int. Cl. F25j 1/02, 3/02
U.S. Cl. 62—28 **13 Claims**



This invention relates to a process for purifying and liquefying a natural gas stream comprising the steps of passing said

stream through absorption units to remove impurities, compressing said stream, liquefying said stream by heat exchange with a low temperature nitrogen refrigeration cycle, stripping



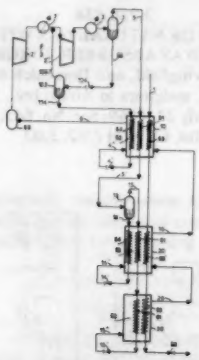
the nitrogen from said liquefied stream, utilizing said nitrogen in said refrigeration cycle, storing a portion of said liquefied stream, and condensing the boil-off from said storage with low temperature nitrogen from said cycle.

3,780,535

METHOD OF COOLING A GASEOUS MIXTURE AND INSTALLATION THEREFOR

Bernard Darredeau, Paris, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Dec. 20, 1971, Ser. No. 209,810
Claims priority, application France, Dec. 21, 1970, 7046084
Int. Cl. F25j *1/00, 3/06, 5/00*
U.S. Cl. 62—40 **4 Claims**



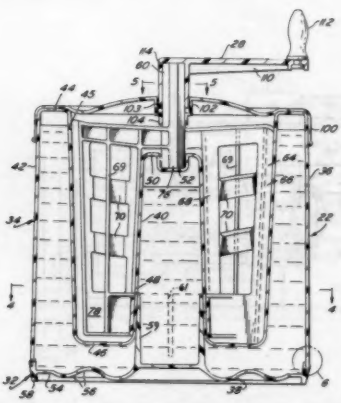
A method of and apparatus for cooling and condensing a gaseous mixture by means of at least one frigorific cycle utilizing a cycle mixture which may include at least one constituent of said gaseous mixture, the cycle mixture being cooled and subjected to fractional condensation under high pressure; at least the first condensed fraction obtained during this fractional condensation is expanded to a low pressure lower than said high pressure; at least said expanded portion is vaporized and re-heated at said low pressure, in heat exchange relation with at least the cycle mixture in course of fractional condensation; at least the first heated portion is recompressed from said low pressure to said high pressure in at least one compression stage so as to re-constitute the cycle mixture, at least in part, under the high pressure, the first condensed fraction being obtained immediately after the last stage of compression; the said method further comprises the steps of expanding the portion of the first condensed fraction to the low pressure in at least one intermediate stage, consisting of expanding said portion from a pressure at most equal to the high pressure to a pressure intermediate between the said high and low pressures, a gaseous fraction from the said portion expanded to the intermediate pressure being separated out and re-compressed from the intermediate pressure to the high pressure in order to re-constitute a further portion of the cycle mixture under high pressure. The invention is especially applicable to the liquefaction of natural gas.

3,780,536

ICE CREAM MAKER

Aaron Harry Fishman, Hewlitt Harbor, and George Parmett, Seaford, both of N.Y., assignors to APL Corporation, Great Neck, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,714
Int. Cl. F25c *7/06*
U.S. Cl. 62—342 **4 Claims**



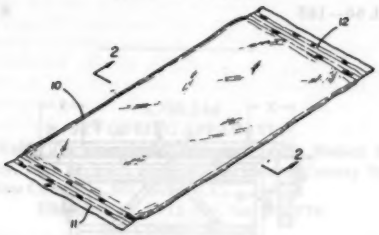
Apparatus is disclosed for making a frozen dessert of the ice cream type. The apparatus includes a cylindrical vessel having an outer generally cylindrical wall, a horizontally extending bottom wall which is integral with said cylindrical wall and a vertically extending post which extends coaxially with the cylindrical wall and extends upwardly from the bottom wall. The vessel is open ended at its upper end for receiving a liquid mass from which a frozen dessert can be made. The wall and the post are hollow and have therein a chamber. The chamber has a refrigerant therein for freezing the liquid mass. A scraping member is provided for removing the mass from the walls of the vessel as the mass is frozen by the loss of temperature through the shell of the walls and the post.

3,780,537

DEVICE FOR USE AS A HOT AND COLD COMPRESS

Jacob H. Spencer, Woodbury, N.Y., assignor to Nortech Laboratories, Inc., North Bellmore, L. I., N.Y.

Filed July 20, 1971, Ser. No. 164,368
Int. Cl. F25d 3/08
U.S. Cl. 62—530 6 Claims



A device for use as a hot and cold compress comprises a tough flexible envelope of plastic material within which is a gel which maintains a gel-like consistency over a wide temperature range.

ERRATUM

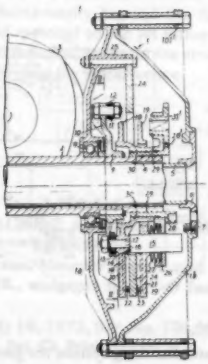
For Class 62—201 see:
Patent No. 3,780,532

3,780,538

CABLE REELING DRUMS

John Brien Mann, Calverton, England, assignor to Metropolitan Tool and Products Limited, Nottingham, England

Filed Sept. 14, 1972, Ser. No. 288,981
Claims priority, application Great Britain, Sept. 17, 1971, 43567/71
Int. Cl. F16l 7/02
U.S. Cl. 64—30 C 9 Claims



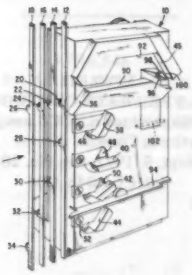
A cable reeling drum for reeling in the cable of a movable machine, such as an electrically driven crane, is driven by a motor through a slipping clutch which is designed to operate continuously over long periods without large scale variation of the transmitted torque. To this end the slipping clutch includes a pair of floating clutch plates, which are axially pressed against a clutch disc member. The clutch plates are driven by means of a spider secured to the clutch input shaft. The spider is connected to one or both clutch plates by means of two or more links which are connected to the spider and the clutch plate so as to permit free axial movement of the clutch plate. Ball joint connections between the links and the spider and clutch plate are provided for that purpose. The clutch disc is preferably channel-shaped to provide improved cooling and the clutch plates and disc are enclosed within a casing forming the output member of the clutch, the casing protecting these parts from dirt and water.

3,780,539

NEEDLE ACTUATING CAMMING FOR CIRCULAR KNITTING MACHINES

Lester Mishcon, Miami Beach, Fla., assignor to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 248,518, April 28, 1972. This application May 16, 1972, Ser. No. 253,720
Int. Cl. D04b 15/32
U.S. Cl. 66—42 7 Claims



In a circular knitting machine wherein multi-butt needles are controlled by camming defining a plurality of raceways, the height of cam sections and the length of the needles is shortened by the provision of preliminary raise cams which are extended to also serve as guard cams and prevent the accidental descent of needles between vertical arrays of rotatably adjustable cams. Each of the adjustable cams may be positively locked in a position to permit needles to welt or in positions to raise needles to a knit or a tuck level from which they may be lowered by a main stitch cam engageable with the same needle butts as the preliminary raise and guard cams. Tilting of the needles in a vertical plane perpendicular to the camming is prevented by a needle engageable member at each feed.

3,780,540

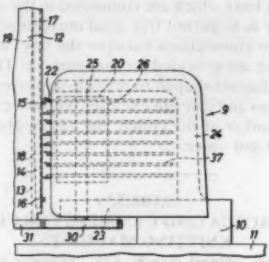
PATTERNING DEVICES FOR KNITTING MACHINES

John Eric Maidens, Ansley Village, near Nuneaton; Kenneth Alison Hartley, Coventry, and Frederick Henry Carrotte, Kirby Muxloe, all of England, assignors to Courtaulds Limited, London, England

Filed July 7, 1971, Ser. No. 160,442
Claims priority, application Great Britain, July 17, 1970, 34731/70
Int. Cl. D04b 15/74, 15/78
U.S. Cl. 66—50 B 7 Claims

A patterning device for a circular knitting machine, comprising a rotatable support carrying selector members which co-operate with butts of knitting elements to select needles for knitting or other operations, each selector member being

movable on the support between two positions providing for different modes of interaction with said butts. Prior to interaction with the butts, the selector members are positioned by



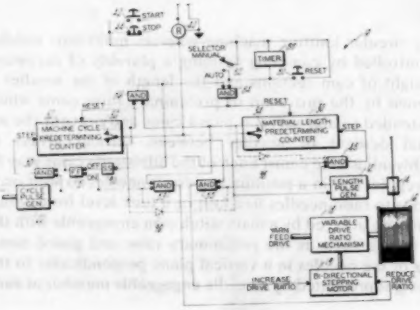
selective interaction with one or more electromagnetically controlled cam surfaces which deflect the selector members from one position to the other or not, as desired.

3,780,541

MATERIAL FEED RATE CONTROL SYSTEM

Jerry L. Haynes, Elizabethtown, N.C., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Sept. 5, 1972, Ser. No. 286,117
Int. Cl. D04b *3/06*
U.S. Cl. 66—125 R **12 Claims**



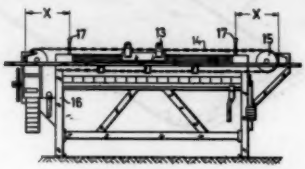
A knitting machine yarn pay off control system having a first presettable counter indexed in a subtraction direction by a first pulse generator to count the amount of yarn paid off from a driven yarn spool, a second presettable counter indexed in a subtraction direction by a second pulse generator to count the number of cycles of operation of the knitting machine and a bi-directional stepping motor automatically connected to be indexed by a pulse generator—after one of the counters reaches zero and before the other counter reaches zero—for correcting for any difference between the actual pay off rate and a desired pay off rate pre-established by the original settings of the counters.

3,780,542

NEEDLE BREAKAGE SAFETY DEVICE

Hans Schieber, and Erich Krause, both of Bopfingen, Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Nov. 10, 1972, Ser. No. 305,398
Claims priority, application Germany, Feb. 10, 1972, P 22 06 363.4
Int. Cl. D04b *35/10*
U.S. Cl. 66—165 **8 Claims**



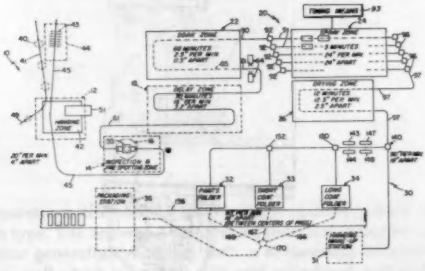
A device for disengaging the sliding carriage of a knitting machine is response to a needle break. The high amplitude sound caused by a break is sensed by a microphone attached to the machine frame, and the amplified output of the microphone toggles a threshold trigger whose amplified output energizes an electromagnet. The latter releases a spring biased lever which in turn moves a shift rod to disengage the carriage drive. Means are also provided for deactivating the safety device when the carriage leaves the needle region, thereby preventing triggering from the noise caused by racking or carriage reversal.

3,780,543

LAUNDERING SYSTEM WITH SOAK OF GARMENTS ON HANGERS

Howard Rosenfeld, New York, N.Y., and Justin J. Wetzler, Evanston, Ill., assignors to A-T-O Inc., Willoughby, Ohio and American Linen Supply Co., Minneapolis, Minn., part interest to each

Division of Ser. No. 55,468, July 16, 1970, Pat. No. 3,686,899.
This application Mar. 13, 1972, Ser. No. 234,096
Int. Cl. D06f *31/00, 39/10*
U.S. Cl. 68—18 F **8 Claims**



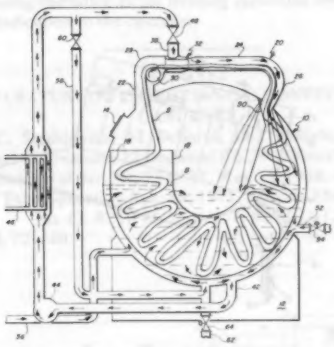
A laundering and finishing system for garments (such as no-iron garments) collected from a number of user sources of soiled garments includes a hanging zone, a washing zone including spray assemblies, a drying zone, and a conveyor network extending from the hanging station through the washing and drying zones, the conveyor network being adapted to support individual garments on hangers to hang loosely for wash-

ing and wrinkle-free drying in the zones, the hanging zone being arranged to enable a worker to hang soiled garments from one user source at a time in serial order upon an initial conveyor of the conveyor network, and the conveyor network being further adapted to discharge the garments in the same serial order so that garments originating from different sources of soiled garments are not mixed. Preceding the washing zone a soak zone is provided including means to guide garments on hangers therethrough.

3,780,544
JET DYEING APPARATUS

James Keith Turner, Lincolnton, and James Robert Riley, Stanley, both of N.C., assignors to Gaston County Dyeing Machine Company, Mt. Holly, N.C.

Filed July 18, 1972, Ser. No. 272,774
Int. Cl. B05c *11/124*
U.S. Cl. 68—177 **7 Claims**



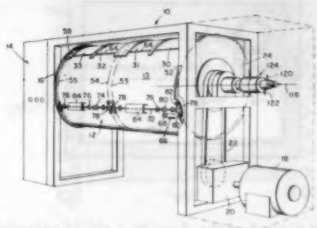
Means is provided for circulating textile material in endless strand form through a wet processing bath under the influence of a venturi-induced jet of a cycled portion of the treating bath. The jet arrangement includes a driven roll member provided for lifting the strand material from the bath, a venturi structure disposed horizontally beyond the roll member for subjecting the strand material to the jet influence, and a perforate baffle member designed to direct the strand material for orderly circulation beyond the jet influence.

3,780,545
WASHING MACHINE AND DOOR STRUCTURE THEREFOR

Raymond G. Henderson, Mount Prospect, and Ervin A. Hess, Chicago, both of Ill., assignors to A-T-O Inc., Willoughby, Ohio

Filed July 10, 1972, Ser. No. 270,059
Int. Cl. D06f *37/28*
U.S. Cl. 68—210 **26 Claims**

A cylindrical drum rotatable in at least one direction about its horizontal axis, the drum having an opening in the peripheral wall thereof and carrying an arcuate door slidably mounted for movement thereon between a closed position overlying the opening and an open position, that improvement comprising a driver connected to the drum and door for moving the door in either circumferential direction relative to the

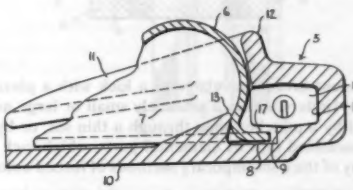


drum, and control means operably connected to the driver and operable for causing the driver selectively to move the door between its open and closed positions.

3,780,546
TRAILER HITCH LOCK

Ernst A. Longenecker, 17820 Robinwood, Brookfield, Wis.

Filed Nov. 10, 1972, Ser. No. 306,027
Int. Cl. E05b *73/00*
U.S. Cl. 70—58 **16 Claims**



An anti-theft device securable by a key controlled lock to the coupler on the front end of a trailer to obstruct access to the socket of the coupler and thereby prevent insertion of the ball of a ball and socket connection by which the trailer can be coupled to a towing vehicle. A cover member slips onto the coupler to close the mouth of the socket and is secured in place by simply inserting the body of a padlock into a cavity in the cover member. No tool is needed to lock the cover member to the coupler.

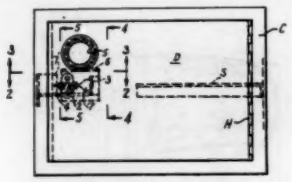
3,780,547
CHILD PROOF LATCHES

Kirk Drumheller, 1029 Cedar, Richland, Wash.

Filed Sept. 30, 1971, Ser. No. 185,198
Int. Cl. E05b *65/06*; E05c *3/14*
U.S. Cl. 70—78 **4 Claims**

A child-proof latching apparatus for a movable door. Finger access from the exterior of the door is permitted through an entry hole adjacent to a latch engageable with a keeper on a stationary door frame member. An inwardly projected dog on the inside surface of the door is located intermediate the entry

hole and latch to provide manual obstacle to latch access and to prevent latch operation by the relatively short fingers of young children. The latch is protected against jamming by ar-



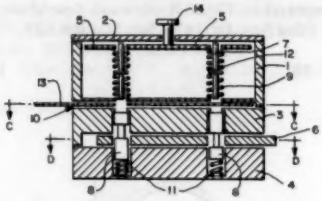
ticles located inward of the door by a shield extended alongside the latch at the side of the latch opposite to the finger entry hole when the door is in a closed condition.

3,780,548

MECHANICAL CODED TRICK LOCK

Ivan Krestev Anastasov, Sofia, Bulgaria, assignor to Glavna Directzia KBUMKP pri SGNS, Sofia, Bulgaria

Filed Oct. 30, 1972, Ser. No. 302,209
Claims priority, application Bulgaria, Oct. 30, 1971, 18901
Int. Cl. E05b *21/00*
U.S. Cl. 70—352 **4 Claims**



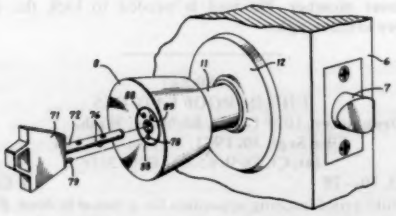
The present invention relates to a lock with a plurality of working cylinders, either a relatively small or large number, controlled by a punched tape through a thin slit, or by a key that is dissembled into its elemental parts, which lock is safe against any of the contemporary methods of forced unlocking.

3,780,549

BINARY MULTI-PLANE CYLINDER

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Sept. 8, 1971, Ser. No. 178,561
Int. Cl. E05b *27/06*
U.S. Cl. 70—358 **11 Claims**



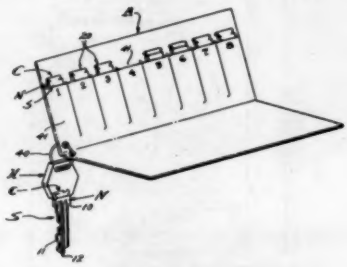
For use in a lockset having a rotary spindle there is provided a lock unit including a binary, multi-plane cylinder with a body defining a circular-cylindrical passage about a central axis and within which a tubular plug is rotatable about the axis. The plug is formed with a circular-cylindrical coaxial keyway within which a circular-cylindrical rod is disposed, leaving an annular space. There is at least one pair of radially aligned openings and holes in the body and in the plug with a tumbler radially movable within the opening and the hole toward the rod under spring pressure. The tumbler is displaceable away from the rod by a tubular, apertured key axially movable into the keyway and fitting over the rod, there being means for preventing relative rotation of the key and the plug. Preferably the body is disposed within a tubular shell having a rib fitting into a slot in the spindle. The shell carries means for preventing relative rotation and axial movement of the body with respect to the shell, such means being accessible from the exterior in at least one rotated position of the plug in the body and being inaccessible from the exterior in at least another rotated position of the plug with respect to the body.

3,780,550

SEPARABLE KEY-HEAD AND FILING SYSTEM

Parvis Simorghi, 10645 Wilshire Blvd., Los Angeles, Calif.

Filed Feb. 15, 1972, Ser. No. 226,496
Int. Cl. E05b *19/04*
U.S. Cl. 70—395 **4 Claims**



A key system especially suited for handling a multiplicity of different keys with facility, reducing their weight and bulk and assuring their accurate selection as circumstances require; and comprised of a releasible coupling configuration incorporated in the separate multiplicity of keys and in the single operating head therefor respecitively; and all of which reduces the keys to their minimum shank configurations containing the lock combinations adapted to be stored in individual file pockets.

3,780,551

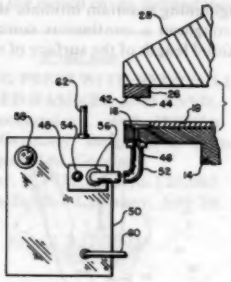
APPARATUS AND METHOD OF FORMING AN ARTICLE DISPLAYING A SELF-MAINTAINING AND SELF-MONITORING QUALITY FEATURE

Archie L. Lind, Lakewood, and Mack R. Cobb, Wheatridge, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Dec. 13, 1971, Ser. No. 207,066
Int. Cl. B21c *43/00*; **B21d** *45/00, 55/00*
U.S. Cl. 72—4 **10 Claims**

An article forming apparatus having a self-maintaining and self-monitoring quality feature and a method of forming an article is disclosed herein. The apparatus includes two reciprocally moving die faces which cooperate with each other in shaping a portion of an article in a predetermined manner. In this regard, one open end portion of an open ended passage or opening provided through one of the two die faces may be utilized in the aforesaid shaping operation. This passage or opening is provided with a flow of gas under pressure, preferably concurrently with the shaping operation of the apparatus, so as to prevent various foreign particles such as, for example, chips or scraps, from lodging or accumulating within or ad-

jacent the passage, which particles might otherwise create an obstruction to the shaping operation, thereby adversely effecting the predetermined shape desired. In addition, the gas pressure within the passage is monitored, preferably continuously, so that, in the event of an obstruction, a signal is produced for terminating operation of the forming apparatus and/or providing an indication to the operator.



3,780,552

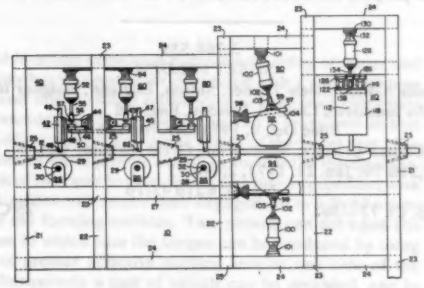
APPARATUS FOR CONDITIONING CONTINUOUSLY CAST BARS

Fred C. Staskiewicz, 11 Deborah Ln., Buffalo, N.Y., and Robert E. Fromson, 27 Dogwood Rd., Williamsville, N.Y.

Continuation of Ser. No. 733,605, May 31, 1968, abandoned. This application Apr. 16, 1971, Ser. No. 134,888

Int. Cl. B21b *45/02, 45/04;* **B22d** *11/12*

U.S. Cl. 72—40 **12 Claims**



Apparatus is disclosed for conditioning a continuously cast bar particularly of the type formed employing a continuous casting wheel and a belt, and includes a plurality of working stations which form in the bar chamfered corners which are thereafter formed into a radius and the surface of the bar is conditioned prior to hot working.

3,780,553

FORGING DIE LUBRICATION

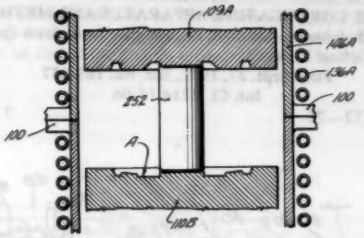
Roy L. Athey, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 141,530, May 10, 1971, abandoned. This application Apr. 6, 1973, Ser. No. 348,569

Int. Cl. B21j *3/00, 1/06, 13/02*

U.S. Cl. 72—41 **5 Claims**

A die for a forging operation, especially isothermal forging, is formed having grooves thereon to act as reservoirs for holding a lubricant for lubricating the die during operation. While the lubricant can be put in the grooves originaly by various means, one means for maintaining lubricant in the grooves during a forging operation where a plurality of billets are forged in succession is to have the billet covered by the lubricant, then each billet would leave some lubricant in the grooves for the next forging while pushing some out to use for its own forging operation.



3,780,554

METHOD OF MANUFACTURING EXTRUDED RODS OF WIRE FROM COMPOUND MATERIAL

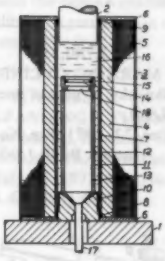
Jan Nilsson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektreska Aktiebolaget, Vasteras, Sweden

Filed Feb. 7, 1972, Ser. No. 224,089

Claims priority, application Sweden, Feb. 12, 1971, 1845/71

Int. Cl. B21c *23/22*

U.S. Cl. 72—60 **2 Claims**



A rod or wire having an aluminum or aluminum alloy core and a copper or copper alloy casing is produced by hydrostatic extrusion of a compound billet through a die having a conical inlet with a cone angle of between 93° and 115°.

3,780,555

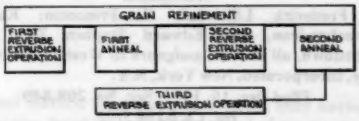
METHOD OF MAKING A PIPE WITH REFINED GRAIN STRUCTURE

Real J. Balthazar, Marina Del Rey, and Richard A. Halberg, Manhattan Beach, both of Calif., assignors to Sargent Industries, Inc., Los Angeles, Calif.

Filed Apr. 10, 1972, Ser. No. 242,708

Int. Cl. B21b *27/06, 17/02*

U.S. Cl. 72—69 **6 Claims**



A method of making a pipe comprising providing a pipe preform having a wall with relatively large columnar grains,

refining the grain of the pipe preform by cold working and annealing, and cold working the wall subsequent to refining the grain to substantially axially elongate the pipe preform.

3,780,556

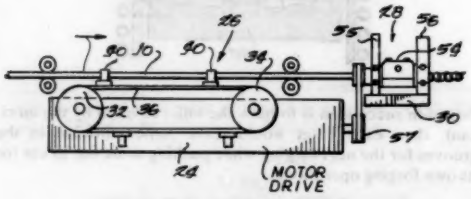
TUBE CORRUGATING APPARATUS AND METHOD

Ernest H. Johnson, Chicago, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Sept. 27, 1971, Ser. No. 183,857

Int. Cl. B21d *15/06*

U.S. Cl. 72—78 **7 Claims**



To form an annularly corrugated tube, an uncorrugated tube is driven in the direction of its longitudinal axis while a toothed corrugating tool mounted for free rotation on a transverse axis is circularly orbited about the tube with successive teeth of the corrugating tool pressing into the surface of the tube to form spaced annular grooves. As the tube moves forwardly each successive groove engages and advances the tooth of the corrugating tool which is employed in its formation, thus commencing the formation of a succeeding groove by a succeeding tooth.

3,780,557

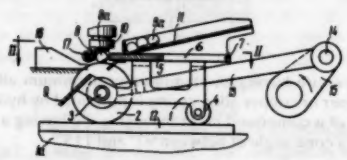
MACHINE FOR MARKING CYLINDRICAL ARTICLES

Efim Lvovich Petrikovsky, Prospekt imeni Lenina, 45, kv. 34, Chelyabinsk, U.S.S.R.

Filed Dec. 22, 1971, Ser. No. 210,665

Int. Cl. B21b *1/00*

U.S. Cl. 72—92 **3 Claims**



Machine for marking cylindrical articles, comprising a drum mounted for rotation and longitudinal reciprocation on a guide; a holder plate being mounted between a marking tool and the drum, also for longitudinal movement synchronous with that of the drum, and featuring a seat to accomodate the articles therein.

3,780,558

APPARATUS FOR STRAIGHTENING ELONGATED MEMBERS

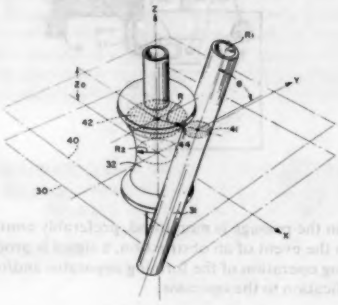
Peter Frederick Lilienthal, II, Princeton; Karapurath Remachandran, and Edward Stephen Tice, both of Hightstown, all of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,849

Int. Cl. B21d *3/02*

U.S. Cl. 72—98 **2 Claims**

Tubular members, such as sections of tubing for use in millimeter waveguide systems, are straightened through the use of roller or rotary straightener apparatus. The previously common creation of helical indentations along the inner walls of the tubular members, which has been found to result from a discontinuous surface contact at discrete points between the tubular members and conventional straightening rollers, is avoided by the use of special-purpose rollers. The special-purpose rollers are shaped such that the tubular members undergoing straightening maintain intimate surface contact with the rollers throughout a continuous contact path extending along a substantial length of the surface of each roller.



Each special-purpose roller may be formed by positioning a cylindrical cutting tool, of a diameter equal to that of a tubular member to be roller straightened, at a selected acute angle to the axis of a roller blank and in contact with the roller blank, and then rotating both the cutting tool and the roller blank. Subsequent roller straightening will take place with each tubular member oriented at the selected acute angle to the finished roller.

Alternatively, a mathematical analysis may be employed to characterize the required roller shape. Numerically controlled machining techniques may then be utilized to form the special-purpose rollers in accordance with the determined shape.

3,780,559

SHEET FEEDING

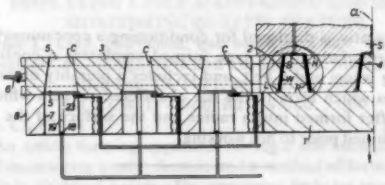
Leslie Ashton Steele Turner, Sutton, England, assignor to Airfix Industries Limited, London, England

Filed Oct. 4, 1971, Ser. No. 186,229

Claims priority, application Great Britain, Oct. 5, 1970, 47,318/70; Jan. 21, 1971, 2,846/71

Int. Cl. B21d *43/16*

U.S. Cl. 72—361 **25 Claims**



A foil loading mechanism for use with an injection moulding machine producing containers having foil side wall, the mechanism comprises a body forming the peripheral wall of a cavity for receiving and retaining a foil in deformed condition, an aperture in the wall extending longitudinally of the cavity,

guide means for guiding a foil into a position overlying the aperture and means for driving a foil overlying the aperture through the aperture and into the cavity. The foil in the cavity is then driven from the cavity in a longitudinal direction into a female mould cavity in register with the loaded cavity. Thereafter the male core is inserted into the female cavity and material injected into the mould cavity defined therebetween.

3,780,560

DOUBLE-ACTING PRESS WITH HYDRAULICALLY COUPLED HAMMER AND ANVIL

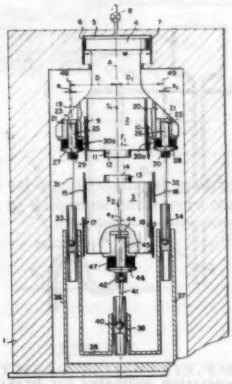
Kurt Zimmer, Hueckeswagen, and Wilhelm Schneider, Dhuenn, both of Germany, assignors to Beche & Grohs GmbH, Huckeswagen/Rhld, Germany

Filed Mar. 2, 1971, Ser. No. 120,083

Claims priority, application Germany, July 28, 1970, P 20 37 339.1

Int. Cl. B21j *9/12*

U.S. Cl. 72—407 **8 Claims**



A double-acting press with hydraulic coupling of upper and lower rams has an upper ram connected with a pair of pistons that extend into a closed oil-filled vessel. At least one other piston extends from this vessel up against a lower ram so that descent of the upper ram causes lifting of the lower ram. The piston rods of these pistons can all be inclined to the displacement axis of the rams to twist these rams into engagement with opposite guides and ensure their engagement in a fixed orientation of the forming surfaces. Two pistons can act upon the lower ram in which case the torque can be produced by using pistons of greater effective surface area to one side of the rams. Alternatively a pair of vessels can be provided, one to each side with a respective pair of pistons, and a pump can be provided to maintain the pressure in one vessel above that in the other. The guides can be two pairs of guides for each ram, one pair being above and laterally offset from the other.

3,780,561

FEED DEVICE FOR FORMING APPARATUS

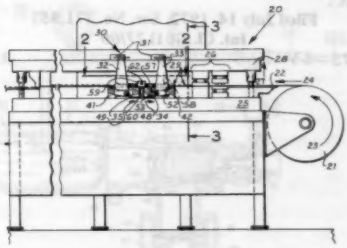
Ward A. Ames, Danville, Ill., assignor to Tridan Tool & Machine, Inc., Danville, Ill.

Filed Dec. 23, 1971, Ser. No. 211,551

Int. Cl. B21d *43/02*

U.S. Cl. 72—417 **10 Claims**

A feeding device for moving a sheet of material through a progressive die apparatus which forms holes into the sheet. In one embodiment of the feed device, a feed bar is slidably mounted in the direction of feed and has a plurality of upwardly biased feed fingers which project through the formed holes in the sheet. The bar is pivotally connected to a link which in turn is connected to means for converting the vertical motion of the forming apparatus press into reciprocating horizontal motion of the feed bar. One embodiment of the means includes a rack connected to the press which is engaged with a pinion mounted on a rotatable shaft. A crank is connected to an end of the shaft and is pivotally connected to the link. Another embodiment of the means includes a member projecting downwardly from the press being pivotally connected to an end of the link. A second guide link is connected



to the base of the feeding device and is also connected to the downwardly extending member. The feeding device has either a single feed bar for moving the sheet of material during the downward or upward stroke of the press or a pair of feed bars are provided which reciprocate in opposite directions so as to move the sheet during both the downward and upward stroke of the press. A power cylinder is provided in one embodiment to control the stroke of one of the feed bars.

3,780,562

DEVICE FOR EXPANDING A TUBING LINER

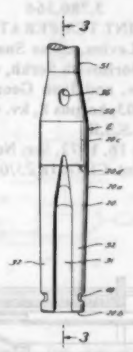
John C. Kinley, 5815 Royalton St., Houston, Tex.

Division of Ser. No. 03,369, Jan. 16, 1970, Pat. No. 3,691,624.

This application July 10, 1972, Ser. No. 269,966

Int. Cl. B21j *13/02*

U.S. Cl. 72—479 **5 Claims**



A device and method for expanding a tubing liner having a preformed reverse bend by pulling the metal of the liner outwardly to expand the reverse bend and bring the liner into a substantially cylindrical shape inside of a well tubing or other pipe.

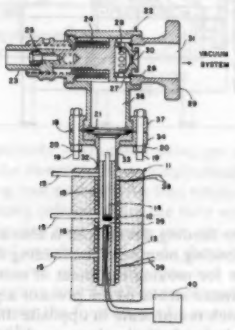
ERRATUM

For Class 72—465 see:
Patent No. 3,780,591

3,780,563
INSITU TRANSFER STANDARD FOR ULTRA-HIGH VACUUM GAGE CALIBRATION

Ronald A. Outlaw, Newport News; Richard E. Stell, Hampton, and Ronald F. Hoyt, Tabb, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 14, 1972, Ser. No. 271,951
Int. Cl. G01l *27/00*
U.S. Cl. 73—4 V **12 Claims**



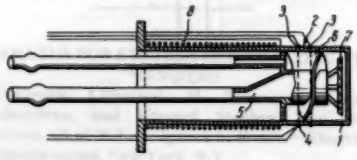
A compact insitu calibration assembly for ultra high vacuum gauges which depends on the repeatable generation of a specific gas pressure by the dissociation of a solid solution chemical compound when subjected to a given temperature.

A precise temperature measurement is related to the pressure generated within the vacuum by the properties of the solid solution compound. This accurately establishes the gas pressure which in turn is used to calibrate a vacuum gauge. Also included is a metering orifice used in the calibration system and which is made movable to facilitate the degassing bakeout required in ultra high vacuum devices.

3,780,564
FLUE GAS DEW POINT TEMPERATURE TRANSDUCER

Tatyana Abramovna Levina, ulitsa Snaiperskaya, 10, korpus 1, kv. 69; Mikhail Borisovich Serkh, ulitsa Moskvina, 5, kv. 46, both of Moscow, and Ivan Georgievich Guzynin, Oktyabrsky propekt, 403, korpus 8, kv. 63, Ljubertsy Moskovskoi Oblasti, all of U.S.S.R.

Filed May 16, 1972, Ser. No. 253,729
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 A **3 Claims**

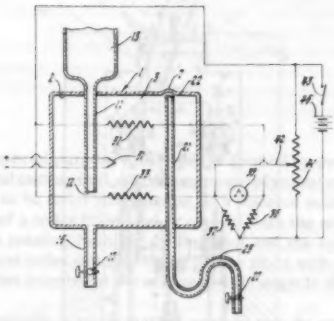


A flue gas dew point temperature transducer having a heated shell with primary cell electrodes and a thermoelement disposed on the portion of the shell surface which serves as a flue gas vapor condensation area. Cooling said condensation area is effected by a coolant supplied to and led off said condensation area by a coolant inlet and a coolant outlet duct mounted inside the transducer shell. One of the ducts forms a helix wound around the other duct, whereby the measurement accracy is enhanced and the transducer application range is extended.

3,780,565
FLUID VAPORIZATION TESTER

Jerry F. Hawkins, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 19, 1972, Ser. No. 299,144
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 A **1 Claim**



A fluid vaporization indicator for brake fluid in which a chamber of specified volume is filled with test fluid and heated by two resistors arranged one above the other in the chamber and connected in a bridge circuit. When sufficient vapor has been formed so that the upper resistor is exposed to vapor, that resistor's resistance increases and the bridge circuit shows an imbalance. The temperature at this instant, as measured by a thermocouple in the fluid, approximates the vapor-lock temperature of the fluid. The chamber includes an inlet, outlet and overflow tube arrangement to insure consistent sample sizes and to facilitate emptying and flushing the chamber between tests.

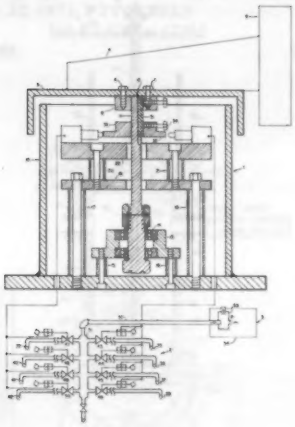
3,780,566
APPARATUS FOR CONTINUOUSLY MONITORING AIR-POLLUTION

Kenneth Burton Smith, and Shaul Gladstone, both of Wilmington, Del., assignors to Argus Chemical Corp., Brooklyn, N.Y.

Filed Mar. 7, 1972, Ser. No. 232,467
Int. Cl. G01n *31/00*
U.S. Cl. 73—23 **10 Claims**

Apparatus and process for continuously monitoring the air pollution around a manufacturing plant comprising a weather vane to sense the direction of the wind, multiple air sampling means positioned to sample air from different compass directions, a valve in line with each air sampling means, an air sample analyzer and recorder, means for transmitting a signal from the weather vane indicating the direction of the wind to the valve which is in line of the air sampling means positioned to sample air in that particular wind direction, means for

drawing in an air sample from the atmosphere in the direction of the wind by sucking the air in through the air sampling



means, through the valve and into the air analyzer with means in the air analyzer to determine and record the degree of a given air pollutant.

3,780,567

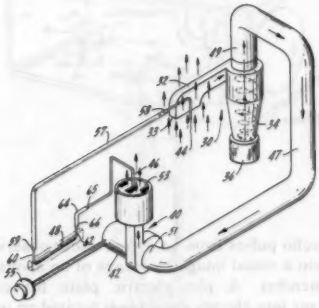
DRIFT MEASUREMENT SYSTEM

John C. Ovard, Santa Rosa, Calif., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Mar. 17, 1972, Ser. No. 235,484

Int. Cl. G01n *1/22*

U.S. Cl. 73—28 **11 Claims**



A drift measurement system to quantitatively measure the drift emitted from a cooling tower. The drift measurement system includes: sample collecting means for collecting test samples from various points in the fan stack exhaust air; isokinetic sampling control means to insure that the drift particles collected are truly representative of those entrained in the exhaust air; cyclone separator means for separating the liquid or solid particles from the test sample; and container means for receiving the separated liquid or solid particles.

3,780,568

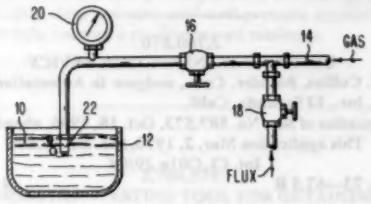
QUANTITATIVE TEST METHOD FOR MEASURING SOLDER-FLUX SURFACE TENSION INTERACTION

Lewis S. Goldmann, Ossining; Dexter A. Jeannotte, Clinton Corners, and Bodgan Krall, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 27, 1971, Ser. No. 166,535

Int. Cl. G01n *13/02*

U.S. Cl. 73—64.4 **11 Claims**



A process for quantitatively measuring one of the surface tension components for a solder-flux combination by introducing a gaseous ambient bubble internally coated with a liquid flux into a molten solder, and measuring a pressure differential.

3,780,569

TENSIOMETER ASSEMBLY FOR SUBSTITUTION TYPE ANALYTICAL BALANCES

John W. Graham, Rt. 3, Box 41, Alvin, Tex.

Filed Sept. 2, 1971, Ser. No. 177,223

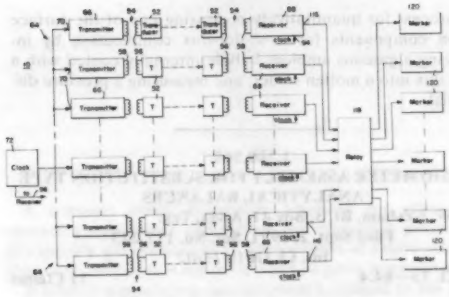
Int. Cl. G01n *13/02*

U.S. Cl. 73—64.4 **11 Claims**

A tensiometer assembly for use with substitution type analytical balances that is particularly designed to take the place of the conventional weighing pan with which such balances are commonly provided. The tensiometer assembly comprises an elongated support mechanism having a support eye at the upper extremity thereof that is adapted to be received by the hook portion of the weighing arm of a substitution type analytical balance, thereby suspending the tensiometer assembly in vertical relation within the weighing chamber of the balance. The support mechanism includes a

needle chuck device, disposed at the lower extremity thereof, that is adapted to support a conventional duNouy ring in substantially rigid relation with the support mechanism. A container for a liquid defining the interface to be tested may be raised or lowered in accurately controllable manner by a movable support device. The support device may be capable of moving the container downwardly at a controlled rate of speed thereby moving the interface downwardly past the ring portion of a duNuoy ring or other suitable tensiometer device suspended in the liquid by the support mechanism. The force necessary to move the duNuoy ring through the liquid interface is accurately measured by the analytical balance.

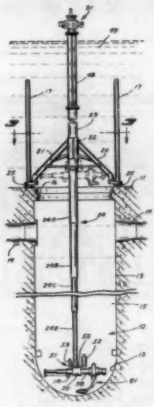
3,780,570
ULTRASONIC INSPECTION DEVICE
Jack T. Collins, Boulder, Colo., assignor to Automation Industries, Inc., El Segundo, Calif.
Continuation of Ser. No. 587,573, Oct. 18, 1966, abandoned.
This application Mar. 2, 1970, Ser. No. 14,806
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.5 R **4 Claims**



An ultrasonic device for nondestructively testing flat, bonded panels such as plywood or particle board panels. A transmitting set of roller type ultrasonic transducers are positioned on one side of a workpiece-transporting line, while the receiving transducers are placed on the other side of the line. Transmitters supply an ultrasonic pulse signal to each transmitting transducer. If the panel is well bonded, the associated receiving transducer receives the ultrasonic signal. A clock controls the actuation of the transmitters, turns off the transmitters, and after a time delay, turns on the receivers, responding to reverberations in a good panel. A panel marking device is actuated if a received signal is not present due to a defect in the panel.

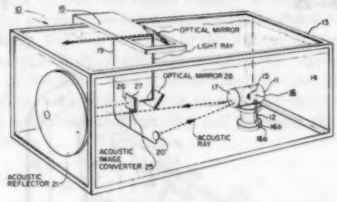
3,780,571
REACTOR VESSEL INSPECTION DEVICE
Robert W. Wiesener, Roseville, Minn., assignor to Programmed & Remote Systems Corporation, St. Paul, Minn.
Filed Apr. 22, 1971, Ser. No. 136,411
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 S **15 Claims**

A device for in place inspecting nuclear reactor pressure vessels and which can be removed from the vessel when the vessel is in service. The device can be utilized to inspect the vessel during routine maintenance. Further, the device is mounted so that its position and movements can be repeated on subsequent inspections, and by proper recording of data



from initial inspections, defects, cracks, or other hazardous situations can be discovered.

3,780,572
ULTRASONIC INSPECTION APPARATUS
Henry A. F. Rocha, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 156,226, Jan. 24, 1971, abandoned.
This application Sept. 18, 1972, Ser. No. 290,253
Int. Cl. G01n *29.04*
U.S. Cl. 73—67.5 R **15 Claims**

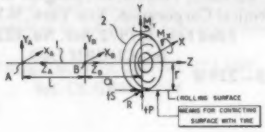


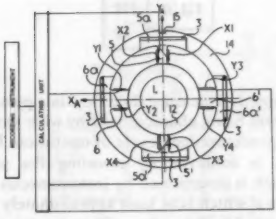
Acoustic echo pulses from an object under observation are converted into a visual image by means of an acoustic image converter member. A piezoelectric plate for converting acoustic energy into electrical energy is located on one side of the member and an array of light emitting elements is located on the opposite side of the member. An array of amplifier and signal conditioning channels is located between the piezoelectric plate and the array of light emitting elements. Each channel has an input connected to a respective point on the piezoelectric plate and an output connected to each of the amplifier and signal conditioning channels for periodically rendering each of the channels conductive to pass electrical signals after a first predetermined interval of time from a periodically occurring zero reference time and for maintaining conduction in the channels for a second predetermined interval of time.

3,780,573
UNIFORMITY TEST MACHINES

Walter Reus, Freigericht, Germany, assignor to Dunlop Limited, London, England

Filed Mar. 13, 1972, Ser. No. 234,419
Claims priority, application Germany, Mar. 22, 1971, P 21 13 820.5; Mar. 22, 1971, P 71 10 863.9
Int. Cl. G01m *17/02*
U.S. Cl. 73—146 17 Claims



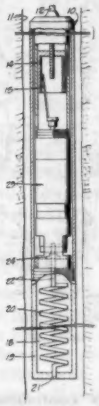


Apparatus and a method for determining wheel/tire uniformity in which the wheel is rotatably mounted on one end of a support shaft and rotated under load against a moving surface. The support shaft is clamped in two spaced apart force-measuring devices each being sensitive in at least two directions which are perpendicular to one another and to the support shaft.

3,780,574
WELL PRESSURE MEASURING AND RECORDING DEVICE

Leonidas C. Miller, 1321 Sombrero Dr., Monterey Park, Calif.

Filed June 14, 1972, Ser. No. 262,779
Int. Cl. E21b *49/00*; G01l *19/08*
U.S. Cl. 73—151 12 Claims

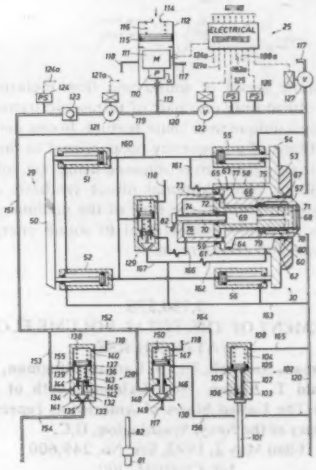


A device adapted to be lowered into a well on a wire line for measuring and recording well pressure employs a multiple-turn cylindrical Bourdon tube carried by a housing and having its interior exposed to well pressure. An axially-extending pin driven by said Bourdon tube is mounted to turn in the housing. A shaft having a wedge-shaped groove in its outer surface is connected to the pin at one end and is connected at the other end to drive the slow speed shaft of a motion multiplier gear device. A recording mechanism in the housing of the movable member is connected to be driven by the high speed shaft of the motion multiplier device. Two radial pins each carried by a separate rotary collar project into the shaft groove to limit turning movement of the shaft in both directions when their respective collars are fixed relative to the housing. The Bourdon tube may be pressurized when at the ground surface and the position of the radial pins adjusted in the shaft groove so that the shaft does not turn until well pressure applied to the Bourdon tube reaches a predetermined minimum.

3,780,575
FORMATION-TESTING TOOL FOR OBTAINING MULTIPLE MEASUREMENTS AND FLUID SAMPLES

Harold J. Urbanosky, Pearland, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,235
Int. Cl. E21b *49/00*
U.S. Cl. 73—152 40 Claims



In the representative embodiment of the new and improved wireline formation-testing apparatus disclosed herein, pressure-responsive fluid-admitting means and tool-anchoring means are cooperatively arranged on a tool body for selectively anchoring the tool in position in a well bore for obtaining at least one measurement or fluid sample from a sub-surface earth formation. The new and improved tool further includes a selectively-operable hydraulic pump which is coupled by a plurality of selectively-operable hydraulic valves to the pressure-responsive means as well as to one or more pressure-responsive flow-control valves. By arranging each of the hydraulic control valves to operate only at selected hydraulic pressures, the new and improved formation-testing tool is sequentially operated as required to obtain selected measurements and, if desired, one or more samples of the formation fluids from one or more formation intervals before removing the tool from the well bore.

3,780,576

HIGH ENERGY SLURRY EXPLOSIVES

H. Dean Mallory, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1971, Ser. No. 176,265
Int. Cl. G01l 5/14
U.S. Cl. 73—167 2 Claims

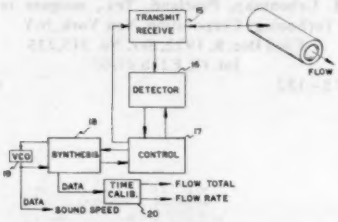
A method of testing the uniformity of liner effectiveness. Randomly selected shaped bomblet cases are uniformly filled with a slurry explosive. The cases are fired into armor plate targets and the relative uniformity of penetration between bomblet cases is measured.

3,780,577

ULTRASONIC FLUID SPEED OF SOUND AND FLOW METER APPARATUS AND METHOD

Alvin E. Brown, Redwood, Calif., assignor to Saratoga Systems, Inc., Cupertino, Calif.

Filed July 3, 1972, Ser. No. 268,712
Int. Cl. G01f 1/00; G01p 5/00
U.S. Cl. 73—194 A 21 Claims



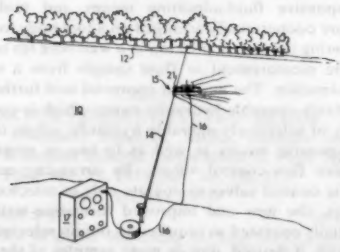
An ultrasonic speed of sound and flow metering system which may utilize only one pair of ultrasonic transducers by incorporating a unique time share feature. In one embodiment a direct synthesis of a frequency proportional to the speed of sound in a flowing medium is obtained using one voltage controlled oscillator. An additional direct synthesis of a data frequency proportional to the flow of the medium is derived from signals inversely proportional to sound energy transit times upstream and downstream.

3,780,578

MEASUREMENT OF THE TOTAL VOLUME FLOW OF A WATERCOURSE

Paul V. Sellman, Norwich, Vt.; S. Larence Dingman, Hanover, and Ronald T. Atkins, West Lebanon, both of N.H., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1972, Ser. No. 249,600
Int. Cl. G01f 1/00
U.S. Cl. 73—227 12 Claims



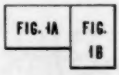
Measurement of the volume flow of a watercourse is accomplished by bridging the watercourse with a taut line and thereafter causing a floating instrumented package to traverse the watercourse, guided by said line. The instrumented package which contains means to ascertain the depth of the watercourse and separate means to measure the velocity of the watercourse, is remotely controlled from one bank of the watercourse. Data collected at spaced intervals along the path of the taut line is used to calculate total volume flow.

3,780,579

DIGITAL INTEGRATING FLOWMETER

Ronald K. Barnard, Tuscola, Ill., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 2, 1972, Ser. No. 222,968
Int. Cl. G01f 1/00
U.S. Cl. 73—229 R 15 Claims



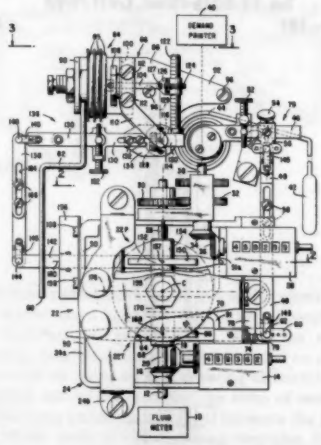
Apparatus adapted to measure fluid flow in a pulsating flow system, such system being characterized by wide variations in flow rate over a predetermined cycle of operation. Reliability in measurement is achieved by counting the pulses, the frequency of which is determined by instantaneous flow rate, over a time interval which is at least approximately as long as the operating cycle for the system. The apparatus also possesses the capability of adjusting for variation in specific gravity of the fluid and, generally, of providing direct readouts in various units of measurement.

3,780,580

LOW PRESSURE INDEX CONTINUOUS INTEGRATOR

Carl J. Kugler, Philadelphia, Pa., assignor to The Singer Company, New York, N.Y.

Filed Sept. 12, 1972, Ser. No. 288,448
Int. Cl. G01f 1/12
U.S. Cl. 73—233 3 Claims



A low pressure index continuous integrator having a diaphragm stack transmitting pressure changes in the throughput flow of a meter through a balanced linkage means to a continuous integrator. The motion of both the diaphragm stack and the continuous integrator is linear, so as to eliminate any possible geometric error in the corrected volumetric mea-

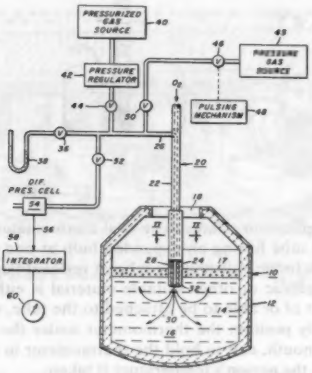
surement of the throughput flow of the meter. The diaphragm stack is mounted on a frame fixedly connected to the housing of the meter. The frame provides an integral block to prevent overexpansion of the diaphragm stack, and a fixed pivot for the linkage means.

3,780,581

METHOD AND APPARATUS FOR DETERMINING THE DEPTH OF SUBMERGED LANCES AND THE LIKE

Thomas R. Acre, New Kensington, Pa.; Frederick M. Gimbel, Kokomo, Ind., and Sundaresan Ramacheandran, Natrona Heights, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1971, Ser. No. 172,697
Int. Cl. G01f *23/14*
U.S. Cl. 73—302 **3 Claims**



Method and apparatus for determining the depth of a submerged article with the use of a pressure probe, and in particular the depth of a submerged lance used to deliver a gaseous reaction agent to a metallic bath. The probe is adjacent or within a conduit delivering the gaseous reaction agent to the bath. The pressure at the probe is compared with that above the bath, the difference between the two pressures being proportional to depth. The system can be used in installations where the pressure at the surface of the bath is atmospheric pressure or in cases where the space above the surface is evacuated as in vacuum decarburization of stainless steels and the like. In the former case, the probe is usually pressurized to prevent clogging of the tip. In the latter case, the ambient pressure at the tip of the probe is compared with that above the surface of the bath and the probe pulse-pressurized periodically to prevent clogging.

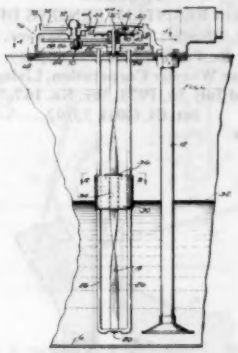
3,780,582

LIQUID PROPORTIONAL MEASURING DEVICE

Fortunato S. Ajero, 521 S. Rawson Ct., South Milwaukee, Wis.

Continuation-in-part of Ser. No. 189,710, Oct. 15, 1971, abandoned. This application Dec. 29, 1971, Ser. No. 213,584
Int. Cl. G01f *23/08*
U.S. Cl. 73—320 **7 Claims**

The gauge is for a tank which is to contain mixed liquids desirably kept in fixed proportionate ratio regardless of the amount of liquid in the tank when filling is started. The drive to the gauge indicator has a gear shift device set to engage at a high ratio when the filling with the low volume liquid is started. Then the indicator will move to "Full" from any position in response to the introduction of only the lower volume of liquid which is proper for the space to be filled. When the drive is then shifted to disengaged position, the indicator will return to the position appropriate to show the proper volume of the high ratio liquid and that needed to fill the tank. For example, in a tank of a fuel and oil mixture for a two-cycle engine, when the gauge drive is set to receive oil, it will register the proper amount of required oil in moving to full position regardless of where the mixture level stood when oil introduction started. Likewise, when the drive is set to receive fuel, it will register the proper amount of fuel in moving to full position, regardless of where the mixture level stood when introduction started.

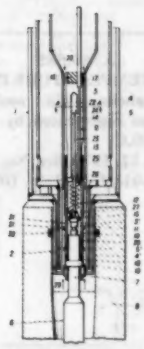


3,780,583

WATER-COOLED MEASURING PROBE FOR MEASURING THE TEMPERATURE OF HOT LIQUID METAL BATHS, IN PARTICULAR IN MELTING OR REFINING FURNACES

Gunter Poferl; Gerald Schmidt, and Hellmuth Smejkal, all of Linz, Austria, assignors to Verinigte Osterrlichische Eisen- und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Aug. 9, 1971, Ser. No. 170,215
Claims priority, application Austria, Aug. 17, 1970, 7435/70
Int. Cl. G01k *1/14*
U.S. Cl. 73—343 R **8 Claims**



The invention relates to a water-cooled measuring probe for continuously measuring the temperature of hot liquid metal baths, comprising an inner tube and an outer tube connected with each other under formation of a probe head to which a sensing portion containing a thermocouple is joined, and a plug connection for connecting a compensating line with said sensing portion; a sleeve closed at its upper end and open at its lower end surrounding the plug connection and means for

sealingly pressing said sensing portion against said lower end of said sleeve. By means of this arrangement the access of water and humidity to the plug connection is absolutely avoided.

3,780,584

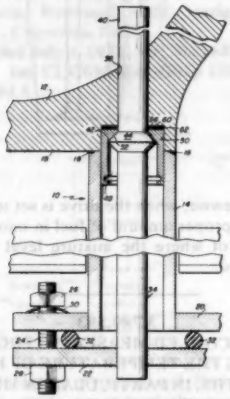
EROSION RESISTENT SENSING DEVICE

William P. Long, Chester; Walter M. Sawyer, West Caldwell, and Lionel J. De Paula Arias, Parsippany, all of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed July 30, 1971, Ser. No. 167,729

Int. Cl. G01k *13/02*

U.S. Cl. 73—349 **5 Claims**



A sensing device for sensing a characteristic of an erosive fluid stream. The device has a sensing element with a bearing surface which bears against a seat member with an end of the sensing element projecting into a conduit through which the erosive fluid flows. The sensing element may be rotated when one side is excessively eroded or withdrawn and replaced completely with another sensing element so that the characteristic can be sensed in spite of the erosiveness of the flowing fluid.

3,780,585

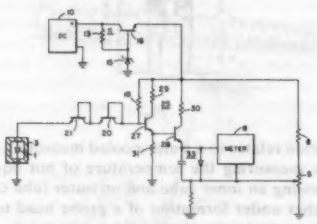
CRYOGEN TEMPERATURE INDICATOR

William C. Milo, Anaheim, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 12, 1972, Ser. No. 217,356

Int. Cl. G01k *7/24, 1/20*; H03f *1/30*

U.S. Cl. 73—362 SC **1 Claim**



A diode, which will vary its voltage in response to a variance in temperature, is housed in a heat sink. The heat sink is placed into a cryogenic material whose temperature is to be measured. The voltage across the diode is indirectly measured so as to give an indication of the temperature of the cryogen.

3,780,586

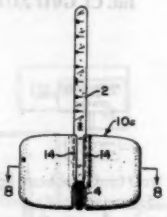
ORAL THERMOMETER

David J. Donofrio, 1407 Herberich Ave., Akron, Ohio

Filed July 6, 1971, Ser. No. 159,962

Int. Cl. G01k *1/14*

U.S. Cl. 73—374 **9 Claims**



This application relates to an oral thermometer in the form of a glass tube having an expanded bulb at one end thereof. Mercury is in the bulb and the tube. A resilient flanged portion made of plastic or other suitable material is either as an integral part of or able to be attached to the tube, which serves to properly position the thermometer under the tongue in a person's mouth, and to hold the thermometer in a fixed position while the person's temperature is taken.

3,780,587

METHODS OF MEASURING INSTANTANEOUS MEAN PRESSURES IN FLUID MEDIA

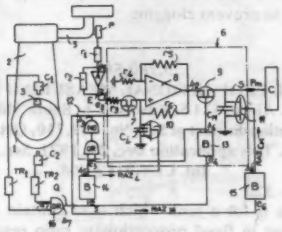
Jean-Pierre Rivere, Billancourt, France, assignor to Rugie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of France

Filed Mar. 10, 1972, Ser. No. 233,629

Claims priority, application France, Mar. 19, 1971, 7109831

Int. Cl. G01l 9/*00*

U.S. Cl. 73—398 R **12 Claims**



Apparatus for measuring a pressure, applicable notably to the specific case of a fluid volume output in a conduit, in which a pressure pick up having a very short response time translates the instantaneous pressure into the form of an electric signal amplified and transformed into a voltage fed to an electric integrator determining the means pressure. At least one pick up emits an electric signal during at least one fraction

of the period for controlling the release of the integrator, its integration period and the resetting thereof.

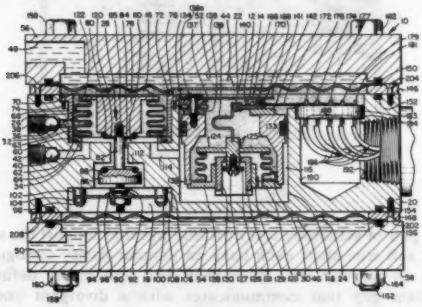
The apparatus is applicable *inter alia* to systems for injecting fuel into internal combustion engines.

3,780,588

DIFFERENTIAL PRESSURE RESPONSIVE APPARATUS

Robert C. Whitehead, Jr., and Lester R. Leidy, Jr., both of Oreland, Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1972, Ser. No. 240,100
Int. Cl. G01l 9/06
U.S. Cl. 73—398 AR **10 Claims**



A flowmeter for converting differential high and low fluid pressure signals into an electrical signal includes a flexible compliance bellows and an overload valve actuating bellows. The high and low differential fluid pressure signals are applied respectively against the inner and outer surfaces of each of said bellows. A spring extends between the compliance bellows and a wafer made of a single crystal silicon material. The wafer includes a diffused fully active resistive bridge pattern thereon and is so arranged that distortion thereof caused by displacement of said compliance bellows results in unbalancing of said bridge and the production of the electrical signal. Adjustable stops are employed whereby the displacement of the compliance bellows is restricted to predetermined differential fluid pressure operating ranges thereby limiting the forces transmitted by the compliance bellows and spring to the wafer to a level below those tending to rupture said wafer.

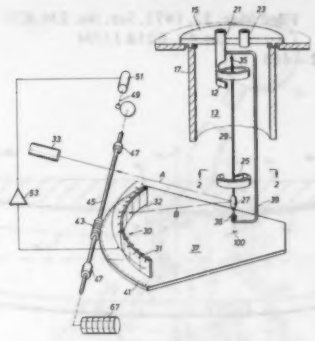
3,780,589

PRECISION PRESSURE MANOMETER

Jerry L. Fruit, Houston, Tex., assignor to Mensor Corporation, Houston, Tex.

Division of Ser. No. 134,607, April 16, 1971, Pat. No. 3,707,868. This application Sept. 12, 1972, Ser. No. 288,259
Int. Cl. G01l 7/04
U.S. Cl. 73—418 **6 Claims**

A design Bourdon tube manometer, wherein tube deflection is detected by sensing the arc subtended by a light beam reflected from a mirror on the Bourdon tube, has a fixed light source and a null reading reflected beam detector. The Bourdon tube itself is mounted on a mounting member which is selectively movable with respect to a frame member on which is mounted the null reading detector. This permits linearizing the response of the instrument. Initially, the range of the instrument is adjusted by moving the mirror parallel to the source light beam to produce a readout corresponding to the upper limit of the pressure range desired to be measured.



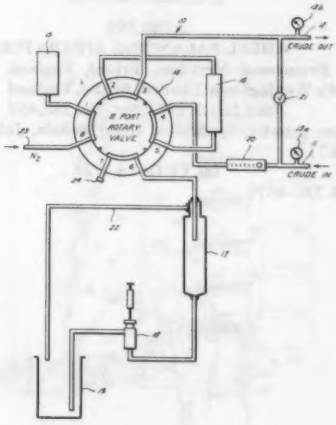
Then the mirror is moved perpendicular to the source light beam to produce a linear response at a point at approximately the mid-point of such range.

3,780,590

ON-STREAM SAMPLE COLLECTING MECHANISM FOR HIGH PRESSURE LIQUIDS

Ralph E. Stamm, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,153
Int. Cl. G01n 1/10
U.S. Cl. 73—422 TC **15 Claims**



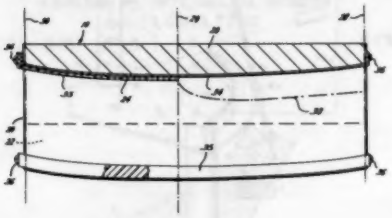
A safe and efficient mechanism for taking liquid samples, as crude oil, at pressures up to 250 psig and transferring them to an atmospheric pressure container for future analysis comprises a double ended through-flow sample holding reservoir connected to an eight port rotary valve for periodically having its contents blown into a depressurizing vessel from which the liquid at atmospheric pressure flows by gravity to a two ended flow-through sample vial to purge it with a fresh sample. The latter vial permits transfer of an aliquot by a conventional automatic sampler for gas chromatographs or the like to an analytical instrument for subsequent analysis.

3,780,591

PIPE BENDING DIE

Edward A. Clavin, and Lionel H. Wheeler, both of Houston, Tex., assignors to CRC-Crose International, Inc., Houston, Tex.

Filed Mar. 22, 1972, Ser. No. 236,879
Int. Cl. B21d *11/04*
U.S. Cl. 72—465 8 Claims



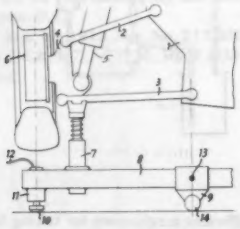
An improved pipe bending die presenting a transversely concave and longitudinally convex bearing surface to the pipe. The bearing surface is comprised of a first longitudinal bearing surface which is hard and which provides substantially all of the external support for the pipe in the direction of the bend, and a second longitudinal bearing surface which is on either side transversely of the first bearing surface, which is compressible to a preselected degree and which provides support for the pipe to prevent bulging without damaging the external coating of the pipe. This abstract is neither intended to define this invention, which of course, is measured by the claims, nor is it intended to be limiting as to the scope of this invention in any way.

3,780,592

WHEEL BALANCING APPARATUS

James Drummond Merrilees, Bristol, England, assignor to Bendix Westinghouse Limited, Bristol, England

Filed July 3, 1972, Ser. No. 268,458
Claims priority, application Great Britain, July 22, 1971, 34,458/71
Int. Cl. G01m *1/28*
U.S. Cl. 73—457 3 Claims



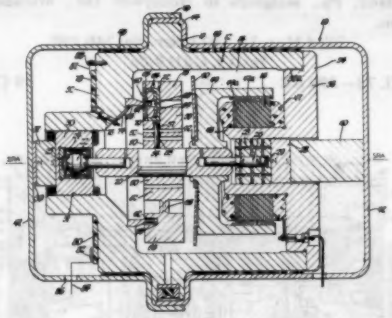
A vehicle suspension supporting transducer arrangement is proposed for on-car wheel balancing in which the transducer is incorporated in one end of a rigid lever on an intermediate position of which a suspension jack is mounted and the other end of the lever is effectively adjustable to positioning of the transducer immediately beneath the wheel centre and of the said other end beneath the point about which cyclic wheel static unbalance forces can be considered to act so that the supporting arrangement reacts substantially complementary forces through the transducer.

3,780,593

MAGNETIC FLUID HYDRODYNAMIC BEARING

Richard J. Coleman, Hales Corners; David J. Foster, Elm Grove; Edward J. Loper, Jr., New Berlin, and Arthur R. Sundeen, Greenfield, all of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1971, Ser. No. 186,823
Int. Cl. G01c *19/20*
U.S. Cl. 74—5 R 4 Claims



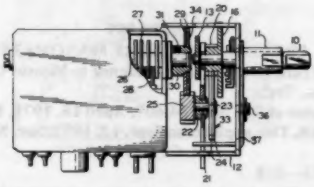
A pair of stationary soft iron bearings that support the ends of a soft iron shaft each have an annular cavity contiguous with an annular rim. Each shaft end and cavity define a uniform gap that communicates with a divergent pocket defined between the rim and the shaft. To hydrodynamically support the shaft when rotated, a magnetically susceptible bearing fluid is disposed in each gap-and-pocket set and is retained therein by a magnetic field provided by a permanent magnet applied across the gaps and divergent pockets. A field return path around the shaft communicates with the opposite pole regions of the magnet. A gyroscope is illustrated as a suitable environment in which these hydrodynamic bearings might be used.

3,780,594

UHF TUNING MECHANISM

Hirohiko Tonari, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 15, 1972, Ser. No. 263,278
Claims priority, application Japan, June 18, 1971, 46/44390; June 18, 1971, 46/44391; June 18, 1971, 46/44392; June 18, 1971, 46/44393
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.52 6 Claims



A tuning mechanism for a UHF tuner of the type which has a tuner control shaft adjustable to tune the UHF tuner. The mechanism has a tuning shaft which is rotatable in step-by-step rotation under control of a detent means, and driving gear means are mounted on the tuning shaft coupled to driven gear means on the tuner control shaft through a pair of planetary

gear means. The planetary gear means are rotatably mounted on a swinging lever which rotates around the tuning shaft under the control of a fine tuning shaft coaxially mounted on the tuning shaft while the tuning shaft is locked in any one of its stop positions by the detent means for fine tuning of the UHF tuner.

3,780,595

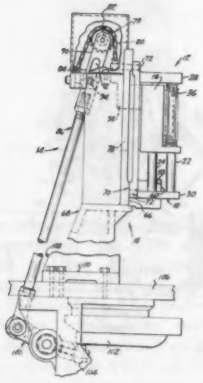
LINEAR MOTION MECHANISM AND MOTION AMPLIFYING DEVICE THEREFOR

John J. Tuss, Englewood, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 7, 1972, Ser. No. 278,339

Int. Cl. F16h *21/16*

U.S. Cl. 74—25 **9 Claims**



A linear motion mechanism is disclosed consisting of an output member comprising a slide block mounted for sliding linear movement on a slide frame, which slide frame is in turn detachably secured to a vertical drive assembly including a mounting frame having a vertically extending mounting surface formed thereon. The slide block is drivingly connected to a motion amplifying mechanism carried on the mounting frame including an input push link on which is rotatably mounted a rotary drive element engaged with a drive chain fixed at one end and connected at the other end to the slide block so that the motion of the slide block is an amplification of the motion of the push link in direction away from the chain ends. The push link is translated by a rotary cam and pivoted lever pinned to one end of the push link. The slide block and slide frame are adapted for use separately from the mounting frame and motion amplification mechanism by mounting it on a horizontal surface and directly engaging the slide block with a rotary cam.

3,780,596

FLOATING SUPPORT FOR THE SHIFT LEVER IN A SHIFT ASSEMBLY FOR A TRANSMISSION

Seihachi Takahashi; Nobuaki Katayama, and Hideki Morino, all of Aichi-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

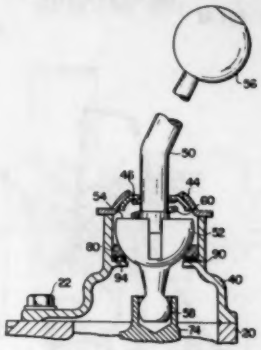
Filed Jan. 24, 1973, Ser. No. 326,458

Claims priority, application Japan, Jan. 28, 1972, 47/010365

Int. Cl. G05g *9/12*

U.S. Cl. 74—473 P **14 Claims**

In a direct-shift type transmission, the shift lever is floatingly supported within an axially-extending retainer in the transmission case by means of a spring axially biasing the shift lever and also by the combination of a seat ring and a resilient member. The seat ring is axially movable within the retainer and has a spherically-shaped surface in contact with a spherically-shaped surface on the shift lever. The resilient member is positioned between a support surface on the retainer and the seat ring so that it resiliently supports the seat ring against the biasing action of the spring.



3,780,597

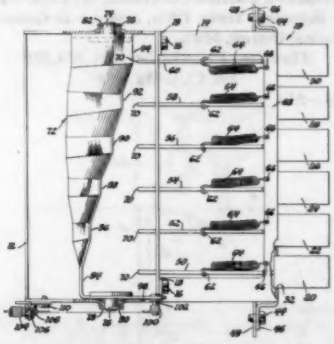
PUSHBUTTON SHIFT MECHANISM

Robert L. White, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1972, Ser. No. 297,302

Int. Cl. G05g *13/02*

U.S. Cl. 74—483 PM **7 Claims**



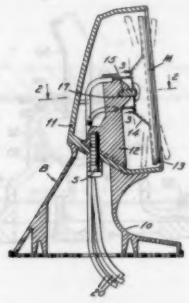
The drawings illustrate a pushbutton transmission shift mechanism including pushbutton members each having an inner abutment face formed thereon, a contoured member having a plurality of flat surfaces formed thereon at equal angles with respect to each adjacent flat surface and directly aligned with the respective inner abutment faces for being selectively pivotted thereby to a face-to-face relationship therewith upon selective depression of respective pushbuttons, a lever formed on an end portion of the contoured member, and a transmission selector cable connected to the lever for actuating selective transmission drive ratios.

3,780,598

REMOTE CONTROL MIRROR

Keith J. Menger, Greenville, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Apr. 12, 1972, Ser. No. 243,234
Int. Cl. F16c 1/10
U.S. Cl. 74—501 M 16 Claims



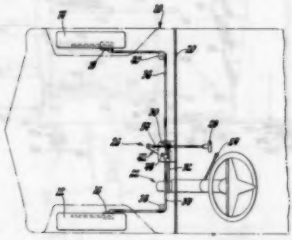
A remote control mirror comprising a mirror support, a base, a trunnion, interengaging means between the trunnion and the base limiting the pivotal movement of the trunnion with respect to the base in a single plane about a first axis, and interengaging means between the trunnion and mirror support limiting the pivotal movement of the mirror support about a second axis at a right angle to the first axis. The mirror construction further includes cable means acting on the mirror support for selectively moving said mirror support into any desired position by the combined pivotal movement about each of the axes.

3,780,599

PARKING BRAKE CONTROL MECHANISM

Ernest D. Schaefer, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1973, Ser. No. 324,206
Int. Cl. G05g 1/04
U.S. Cl. 74—516 2 Claims



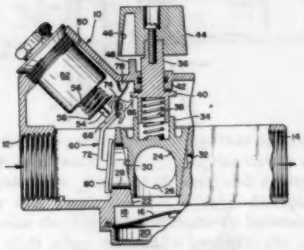
A vehicle parking brake apply mechanism which increases the apply force from the hand or pedal apply lever by means of a mechanical advantage which varies with the travel of the apply lever so that the mechanism initially has a low mechanical advantage which phases into a high mechanical advantage. The mechanism also changes the direction of the apply force to a plane substantially perpendicular to the original force so that it is particularly adapted for front wheel parking brake systems. The parking brake apply lever has an interlock with the transmission gear selector so that the gear selector cannot be moved into the park position until the parking brake has been applied. The interlock will not allow release of the parking brake until the transmission gear selector is moved from the park position.

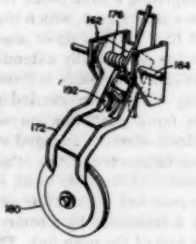
3,780,600

DUAL LEVER MECHANISM

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 162,556, July 14, 1971, Pat. No. 3,747,617. This application Feb. 20, 1973, Ser. No. 333,591
Int. Cl. G05g 1/04
U.S. Cl. 74—519 4 Claims





Dual lever mechanisms especially well suited for use in a combination control device for gas burner apparatus having a reset operator, an electromagnetic holding device and a safety valve member, the dual lever mechanisms including a first lever having one arm actuated by the reset operator, a second arm engaging the magnet armature and a third arm spaced from the second arm and movable into engagement with a second lever for the safety valve member and pivoted in common with the first lever; lost motion is provided between the first and second levers such that the second lever is not engaged by the third arm of the first lever until the final movement of the reset operator whereupon the valve member is lifted from its seat a slight amount thereby permitting the pressure differential experienced across the valve to be balanced. A torsion spring for the second lever thereafter moves the second lever so as to fully open the safety valve.

3,780,601

PLANET CARRIER FOR PLANETARY-GEAR TRANSMISSION

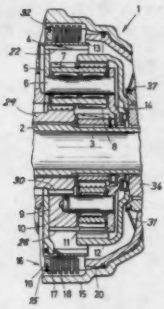
Hansjorg Dach; Karl Heinz Bordowsky, and Manfred Bucksch, all of Friedrichshafen, Germany, assignors to ZF-Borg Warner GmbH Industriegebiet Sud, Friedrichshafen, Germany

Filed May 15, 1972, Ser. No. 253,439

Claims priority, application Germany, May 14, 1971, P 21 24 009.5

Int. Cl. F16h *57/10, 3/44, 1/28*

U.S. Cl. 74—762 10 Claims



A planet carrier mounted on a central shaft, in a transmission housing, comprises a disk with a toothed periphery matingly engaged by the complementarily crenellated periphery of a drum coaxial therewith, the drum serving as a support for a set of annular clutch or brake foils which are interleaved with similar foils on the surrounding housing. Several segments of the disk periphery are partly severed from the disk body to form tongues which are bent out of the disk plane toward the interior of the drum and are locked in place by radially inbent portions of the drum periphery.

3,780,602

LOCKING ARRANGEMENT FOR VEHICLE GEARBOX

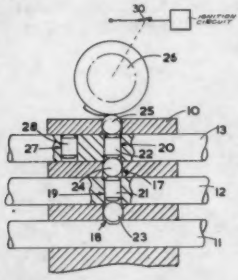
Derek Thornley, Nelson, England, assignor to Joseph Lucas (Industries) Limited, London, England

Filed Feb. 16, 1972, Ser. No. 226,789

Claims priority, application Great Britain, Feb. 17, 1971, 4,884/71

Int. Cl. B60k *21/00*

U.S. Cl. 74—850 7 Claims



A locking arrangement for a vehicle gear box comprises a transverse passage in the gear box housing and intersecting the axes of the gear selector rods. An outside one of the rods has a recess and the remainder of the rods have transverse through bores, the recess, the bores and the passage being in alignment when a predetermined gear ratio is selected. Plungers slidable in the rod bores and members slidable in the passage between the rods are movable by an actuator to lock the rods in the position corresponding to the predetermined ratio.

3,780,603

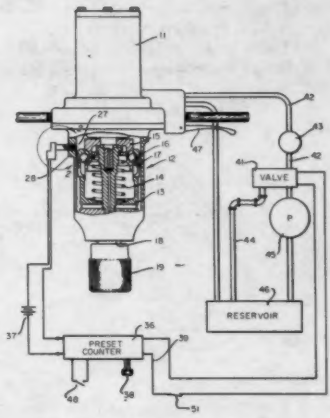
IMPACT CONTROL FOR IMPACT WRENCHES

George C. Whitaker, Los Altos, Calif., assignor to Wolff Sales Engineering Company, Redwood City, Calif.

Filed May 11, 1972, Ser. No. 252,492

Int. Cl. B25b *19/00*

U.S. Cl. 81—52.3 5 Claims



A control for impact wrenches and method in which a predetermined number of impacts are delivered after the wrench has applied a predetermined torque.

3,780,604

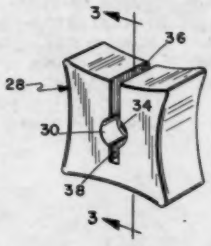
SPLIT SOCKET WRENCH AND METHOD OF USING SAME

Gary J. Wood, 4215 47th St., and Bonnie G. Wood, 1940 California St., both of San Diego, Calif.

Filed July 1, 1971, Ser. No. 155,169

Int. Cl. B25h *13/52*

U.S. Cl. 81—64 1 Claim



A wrench-type handtool for manipulating annular bands such as the clamping rings used on a rubber tube in spear gun slings, the wrench being essentially a block with a bore of a diameter substantially equal to the outside diameter of the ring to be manipulated, with a step or shoulder in the bore having a diameter approximateing the internal diameter of the ring, the block being split so as to be slightly compressible for gripping the ring. The invention includes the method of using the wrench in assembling a spear gun sling, including the steps of placing the rings on a ball-ended wishbone, forcing the ball ends into the ends of the rubber tubing, lubricating the ends of the rubber tubing with a water soluble substance, capturing the rings in the stepped bore of the wrench and manipulating the wrench with the rings therein onto the lubricated ends of the tubing and then, of course, removing the wrench and washing the assembled sling to remove the lubricant. A special clamp is disclosed for clamping the rubber tubing close to the ends thereof while manipulating the ball ends of the wishbone

into the bore of the tubing and while manipulating the rings onto the ends of the tubing.

3,780,605

GUIDING DEVICE, ESPECIALLY FOR SPLITTING AND BEVELING MACHINES

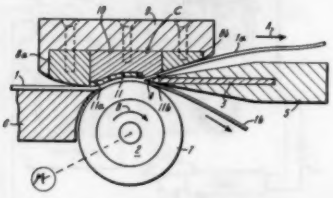
Karl Fingerle, Korb; Jurgen Haag, Stuttgart-Hedelfingen, both of Germany, assignors to Fortuna-Werke Maschinenfabrik Aktiengesellschaft, Stuttgart, Germany

Filed Sept. 11, 1972, Ser. No. 288,099

Claims priority, application Germany, Sept. 10, 1971, P 21 45 303.2

Int. Cl. B26d *3/12*

U.S. Cl. 83—4 **9 Claims**



A guiding device for splitting and beveling machines in which the material to be split or beveled is fed between a cutting member and a guiding element, said guiding device having a guiding part comprising at least a first guiding section forming the front guiding section when looking in the direction in which the material to be split or beveled is fed toward the cutting member and a second guiding section located behind the first guiding section when looking in the direction in which the material to be split or beveled is fed toward the cutting member. The arangement is such that the first guiding section is made of a synthetic material with a low coefficient of friction with regard to the material to be split or beveled, whereas the second guiding section is made of a hard metal.

3,780,606

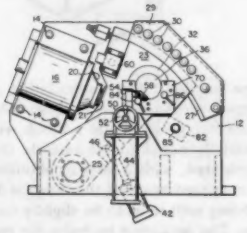
HOT LOG SHEAR

Alfred C. Jentsch, Jr., Fairport; Edward I. Taylor, Jr., Pittsford, and Walter Shukoff, Rochester, all of N.Y., assignors to USM Corporation, Boston, Mass.

Filed May 15, 1972, Ser. No. 253,623

Int. Cl. B23d *17/06;* **B26d** *3/16*

U.S. Cl. 83—23 **7 Claims**



A selected length of a hot aluminum billet or log is fed into the die openings of a relatively fixed and a relatively movable die, which are at the time aligned. Then an arm, which supports one die is pivoted to achieve a scissors-like action between the dies to sever the desired length of billet from the log. The pivotal movement of the arm is continued bringing a fluid-actuated plunger on the arm into alignment with the fixed die, and the movable die with the severed billet therein into alignment with a fluid-actuated fixed plunger. Both plungers are then actuated, respectively, to push the remainder of the log back out of the fixed die into the heating furnace and to push the severed billet out of the movable die whence it is conveyed to the extrusion press. The log is clamped during severing of the billet to prevent any movement of the log inside the dies or the log heater during the shearing operation.

3,780,607

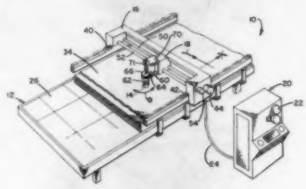
METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed Jan. 3, 1972, Ser. No. 214,579

Int. Cl. B26d *1/10;* **A41h** *43/00*

U.S. Cl. 83—49 **12 Claims**



A method and apparatus for cutting sheet material utilize a reciprocating cutting blade that is guided through a layup of sheet material along a cutting path defining the periphery of a pattern piece. The cutting blade is positioned generally perpendicular to the sheet material being cut and bears a cutting edge which is advanced through the sheet material as the blade is reciprocated. The stroking speed of the reciprocating cutting blade is regulated as the cutting blade advances to prevent excessive heat from being generated due to the frictional contact of the reciprocating cutting blade and the sheet material. Along sections of the cutting path which permit rapid advancement of the cutting blade, the stroking speed is increased to optimize the cutting operation without generating excessive heat and thereby fusing the sheet material. At other sections of the cutting path where the rate of advancement is decreased, the stroking speed is also decreased to reduce local heating and fusion.

3,780,608

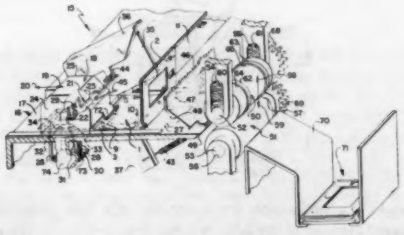
STRIP CUTTING AND MOUNTING APPARATUS

Gordon P. Brown, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,949

Int. Cl. B26d *5/42*

U.S. Cl. 83—375 **7 Claims**



Apparatus for severing a portion of an information bearing strip from a remaining strip length and for sealing such a severed strip portion in a mount, wherein the apparatus is of the kind provided with (*a*) a strip cutting member, (*b*) a strip retaining member and (*c*) a mount sealing mechanism. Upon initial movement of the cutting member toward a strip portion

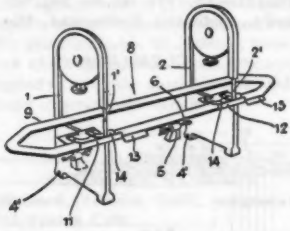
disposed in a mount, a spring is actuated to urge the retaining member from a rest position to a position in which the retaining member firmly holds the strip portion against the mount. In this way, the retaining member serves to prevent the strip portion from being displaced from the mount when the cutting member severs the strip portion from the remaining strip length. Thereafter, the mount and the severed strip portion are transported with the retaining member (which still holds the severed strip portion against the mount) toward the mount sealing mechanism. After movement of the mount and the severed strip portion to the mount sealing mechanism, the spring is actuated to return the retaining member to the rest position.

3,780,609

RIBBON-TYPE COMPOSITE SAWING DEVICE

Giancarlo Storti, Via Bassa di Casalmaggiore 3, Motta Baluffi, Italy

Filed Sept. 11, 1972, Ser. No. 287,643
Claims priority, application Italy, Mar. 17, 1972, 5141 A/72
Int. Cl. B27b *15/08*
U.S. Cl. 83—420 **5 Claims**



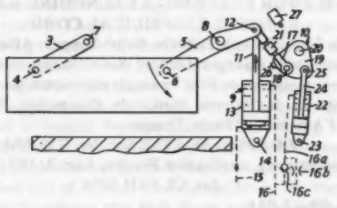
A ribbon-type composite saw for obtaining uniform and continuous wooden strips which comprises a pair of frame-supported ribbon-type saws, the frames resting on a base platform and being provided for means for controlling the position of the blades of the saws. This control consists of movable feet on the points of contact of the frames with the platform, which feet are controlled for angular lateral displacement. The wooden workpieces are fed by an endless flight unit to the saws.

3,780,610

GUILLOTINES OR THE LIKE MACHINES

Herbert Zadow, Stockport, England, assignor to Victory Kidder Limited, London, England

Filed Aug. 30, 1972, Ser. No. 284,921
Claims priority, application Great Britain, Sept. 2, 1971, 40945/71
Int. Cl. B26d *5/12*
U.S. Cl. 83—643 **7 Claims**



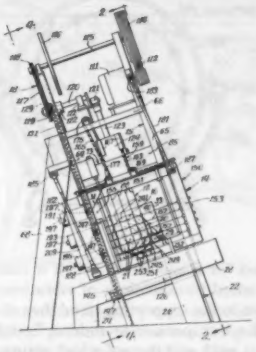
The knife holder of a guillotine or the like machine has an operating arm which is connected to one end of a link, the other end of the link being pivotally connected eccentrically to a crank disc. The arrangement is such that when the knife is at its lowermost position, the pivot axes of the crank disc and of each end of the link are in line thus preventing further downward movement of the knife

3,780,611

SAWMILL

Jesse Wasson Wilson Beckman, c/o Calumet Harbor Lumber Co., 13651 S. Buffalo Ave., Chicago, Ill.

Filed Aug. 12, 1971, Ser. No. 171,116
Int. Cl. B27b *3/04, 3/22*
U.S. Cl. 83—751 **10 Claims**



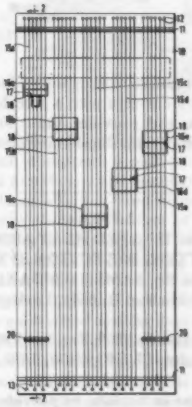
A sawmill, including a log bed for feeding a log, saw means for cutting the log, and a cut-timber bed which receives the timbers into which the log is cut, is inclined to one side so that the log and cut timbers are held in place by their own weight. The sawmill has two gangs of blades which are arranged perpendicularly to each other so that a log can be cut in a single operation directly into timbers. The two gangs of blades are metal cutting blades so that the sawmill can be used to cut logs containing foreign objects, such as nails.

3,780,612

STRINGED MUSICAL INSTRUMENTS

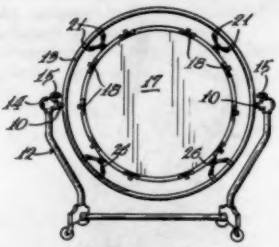
Alan Thomas Robinson, 114 Mount St., London, W. 1, England

Filed June 16, 1972, Ser. No. 263,455
Int. Cl. G10d *1/00*
U.S. Cl. 84—173 **3 Claims**



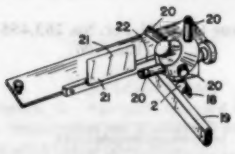
A musical instrument, particularly suited to be played by plucking using one hand, has sets of strings extending over a sound board or table, each set having its own bridge, and each set of strings being tunable to sound a chord the pitch of which can be altered simply by sliding the associated bridge lengthwise of the strings.

3,780,613
BASS DRUM SUSPENSION
William F. Ludwig, Jr., Oak Brook, Ill., assignor to Ludwig Industries, Chicago, Ill.
Filed Apr. 16, 1973, Ser. No. 351,295
Int. Cl. G10d 13/02
U.S. Cl. 84—421 5 Claims



A suspension for a bass drum which is resilient and which prevents unwanted transmissions of vibrations from the beating of the drum to the supporting stand thus eliminating rattles and the like. Each suspension includes a flexible cord having a coiled spring at each end thereof which springs are removable secured to a ring supporting member with the cord slidably passing through an eye provided on the drum shell.

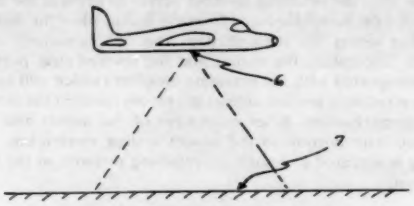
3,780,614
MULTIPLE BULLET AND CARTRIDGE MOUNT FOR FORENSIC MICROSCOPE
Howard A. Maier, Williamsville, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 5, 1973, Ser. No. 329,794
Int. Cl. C06b 21/02
U.S. Cl. 86—1 R 3 Claims



A multiple bullet and cartridge holder for use with a forensic microscope has a carriage with a plurality of conventional mounts for bullets and provides rapid interchangability of specimens for examination, improved indexing and improved manipulation.

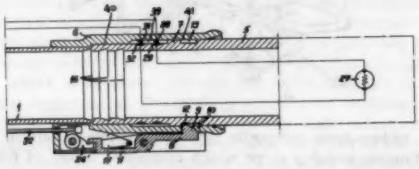
3,780,615
PRESSURE ACTIVATED HEAT ABSORBING OR EMITTING DETECTION SYSTEM
Keith S. Peyton, c/o Hq. SAMSO (SMTAX), AFUPO, Los Angeles, Calif., and Michael D. Jolly, Lexington Ave., Highland Mills, N.Y.
Filed Jan. 6, 1969, Ser. No. 790,513
Int. Cl. G01j 3/00, 5/00
U.S. Cl. 89—1 A 4 Claims

A detector for use in warfare, to provide intelligence information concerning the use of roads or trails by the enemy. The detector comprises an agglomeration of crushable capsules containing reactants for producing a temperature change when the capsules are crushed. The agglomerations are distributed over roads and trails to be monitored and may contain either a chemical which will react with a component of the atmosphere or two chemicals which will react with each other when the agglomerations are crushed. In either case, the reaction produces a change in temperature and a corresponding change in infrared radiation which is detectable by an



overflying aircraft carrying suitable infrared detection equipment.

3,780,616
SET COMPRISING AN INFANTRY WEAPON AND ITS AMMUNITION
Maurice Rusbach, Vernier-Beneva, Switzerland, assignor to Sarmac S. A., Carouge-Geneve, Switzerland
Filed May 10, 1971, Ser. No. 141,700
Claims priority, application Switzerland, May 21, 1070, 7508/70
Int. Cl. F41f 3/04
U.S. Cl. 89—1.8 7 Claims

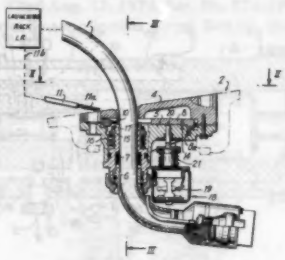


The invention relates to a set comprising an infantry weapon capable of being fired from the shoulder, and ammunition for the same, the said weapon comprising at least one tubular body for guiding a self-propelled projectile which is housed in a case and a control device for firing the projectile. This weapon has at the rear of the said tubular body a device for the ratchet-wise locking of the front end of the case, in the vicinity of which is the nose of the projectile, so that the case is located in the extension of the tubular body of the weapon. Means are provided for releasing the said case during the period of time elapsing between firing of the projectile and its emergence from the front end of the tubular guide body of the weapon and for ejecting the case once the projectile has left this.

3,780,617
DEVICE FOR BREAKING A LAUNCHING RACK-TO-MISSILE UMBILICAL CORD
Frederic Louis Joseph Tabarie, Saint-Tropez; Albert Bernard, Cannes, and Georges Gilbert Saint-Aubin, Gassin, all of France, assignors to Etat Francais represente par le Ministre Charge de la Defense Nationale Delegation, Ministerielle pour l'Armement, Paris, France
Filed Mar. 30, 1972, Ser. No. 239,654
Claims priority, application France, Apr. 2, 1971, 71.11641
Int. Cl. F41f 3/04
U.S. Cl. 89—1.811 4 Claims

In a missile launching apparatus in which a missile is coupled to a launching rack by an umbilical cord which passes through an opening in the skin or fairing of the missile, there is provided a device for severing the umbilical cord. This device includes a rotatable disk provided wth a hole which is offset relative to the axis of rotation of the disk and through which hole the cord passes. A cable is provided connecting the disk

with the launching rack so that upon launching, the disk is rotated through a fraction of a turn. The disk is provided with a knife edge bordering part of the aforementioned hole for purposes of severing the umbilical cord. The hole in the disk is provided in a half of the disk and the other half of the disk is at least substantially imperforate. This latter half of the disk operates to obturate the opening in the skin of the missile after



the umbilical cord has been severed. A safety pin is provided to lock the disk against rotation prior to launching of the missile and this pin is of a strength to be sheared when the disk is rotated by the aforesaid cable. In addition, there may be provided a switch which includes an actuator bearing against the disk and adapted to enter the aforesaid hole upon rotation of the disk in order to actuate the switch.

3,780,618

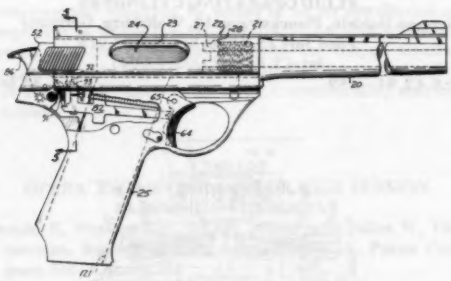
AUTOMATIC HAND GUN

Harry W. Sanford, Arcadia, Calif., assignor to James C. Thomas, III, Encino, Calif.

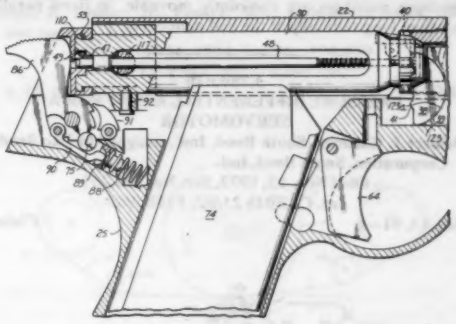
Filed May 20, 1971, Ser. No. 145,259

Int. Cl. F41d *3/06, 11/02*

U.S. Cl. 89—150 **2 Claims**



This invention relates to a recoil-actuated automatic hand gun, which provides for utilizing a maximum sized cartridge in a hand gun system. The reactive thrust as the bullet leaves the muzzle of this gun causes a barrel, barrel extension, receiver, and bolt to slide back locked together a set distance during initial motion until the bullet leaves the bore of the gun, and the gas pressure decreases to a level low enough to permit the safe unlocking of a locked breech action. The sliding receiver reaches its limit of travel and hits a portion of the frame of the pistol. A through-slot in the bolt bears cam surfaces which rotate the bolt out of breech-locking splines in the breech action thereby to release the bolt from engagement with the receiver and permit the inertia of the bolt to carry it backwards to perform ejection, cocking, and the loading of a new cartridge. In order to replace some of the dissipated energy and to increase the speed of travel of the bolt to load spring-return mechanisms, and to perform the functions of the bolt with the speed required, a rotary, mechanical accelerator forms a part of the action and imparts a blow to the bolt at the time that the receiver reaches its stop position. The bolt is rotated out of the breechlocked position by balanced cam follower means fixed to the frame that follow the cam surfaces, and upon return to the breechlocked lock position, the entire assembly travels as a unit to the battery position with a loaded



cartridge in the chamber. A safety tappet pin engages a spiral groove in the bolt to prevent premature firing before the action has reached an appropriate position. The bolt is adapted with unique ejection means, which ejects the spent cartridge case forward and away from the shooter's head and face.

3,780,619

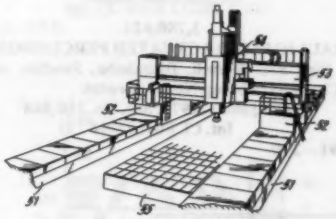
GANTRY MILL FREE FROM THE EFFECTS OF THERMAL DEFORMATION OF A BRIDGE MEMBER

Tetsuo Kitamura, and Akira Tamai, both of Hiroshima-ken, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1972, Ser. No. 233,689

Int. Cl. B23c *1/06*

U.S. Cl. 90—15 **6 Claims**



A gantry mill free, from the effects of thermal deformation of a bridge member, comprises a pair of combinations each consisting of a base member, a bed member on which the base member can travel and which is fixed provided with a driving strip member directed in the direction of travel of the base member, and a driving device engaged with the driving strip member. A bridge member is connected between the head portions of the base members.

In one combination, the base member and the driving device are fixed to each other and the bed and base members are constrained against relative lateral displacement and relative vertical displacement while being capable of relative longitudinal displacement while being capable of relative longitudinal displacement in the direction of travel. In the other combination, the base member and the driving device are constrained against relative longitudinal displacement and relative vertical displacement, but are capable of relative lateral displacement through a distance in excess of the maximum thermal deformation of the bridge member. Also, the bed member and the base member in the other combination are constrained against relative displacement in the vertical direction but are capable of relative displacement in the

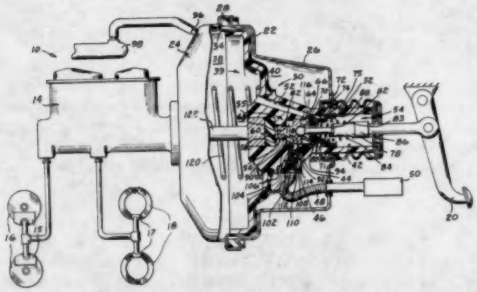
lateral direction through a distance in excess of the magnitude of thermal deformation of the bridge member, and are also capable of relative displacement in the travel direction, with the bed member and the driving device being constrained against relative displacement in the lateral direction. The bed members are fixedly mounted in spaced parallel relation, and the base members are conjointly movable, in fixed parallel relation, longitudinally of the bed members.

3,780,620

PRESSURE DIFFERENTIAL ASSIST FOR A SERVOMOTOR

Delbert J. Gardner, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Nov. 13, 1972, Ser. No. 306,265
Int. Cl. F01b *25/02*; **F15b** *9/00*
U.S. Cl. 91—6 **7 Claims**



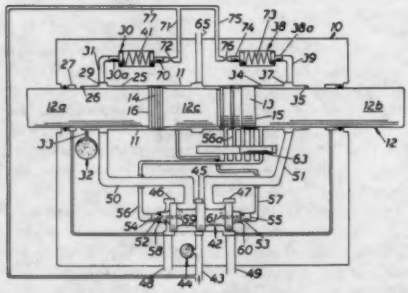
A control for sequentially operating a pressure differential servomotor with air at atmospheric pressure and air above atmospheric pressure in response to an input force for developing an output force to energize an intensifying device to supply a braking system with pressurized fluid.

3,780,621

HYDRAULIC FLUID ACTUATED PERCUSSION TOOL

Gunnar Vigg Riss Romell, Djursholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed June 7, 1971, Ser. No. 150,566
Int. Cl. F01l *25/04*
U.S. Cl. 91—290 **7 Claims**



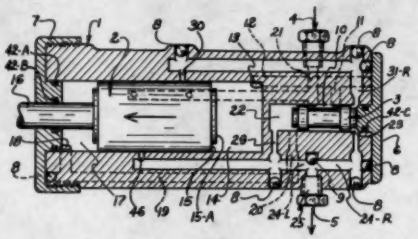
A percussion tool has a hammer piston forming with the cylinder a rear and a forward variable volume work chamber which are alternately pressurized. A fluid accumulator is connected to the rear work chamber and it is loaded by a spring device which is adapted to be automatically pre-loaded in proportion to the pressure in the pressurized hydraulic fluid supplied to the percussion tool. Another identical fluid accumulator is shown connected to the forward pressure chamber.

3,780,622

HYDRAULIC OSCILLATOR AND SYSTEMS ACTUATED THEREBY

Arthur E. Vogel, 1860 E. Cherry St., Columbus, Ohio

Filed June 9, 1971, Ser. No. 151,302
Int. Cl. F01l *25/04*
U.S. Cl. 91—296 **9 Claims**



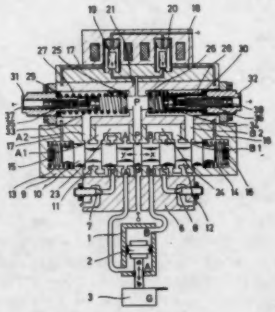
A hydraulic actuator in the form of a fluid actuated reciprocating motor of extreme simplicity consisting of two movable elements and hydraulic circuitry. A housing encloses the two movable elements and the hydraulic circuitry is achieved within the wall of the housing. The two movable elements consist of a reciprocable piston in a cylinder and a reciprocable reversing valve in a chamber. Fluid flow through the system is continuous and uninterrupted. The reversing valve is moved alternately to its two different positions and held in such positions, by pressure differential created by different flow conditions set up at its opposite ends. These differential flow conditions are set up under the control of cylinder inlet and outlet ports which are connected to the valve chamber and are covered and uncovered by the piston during its reciprocation.

3,780,623

VALVE UNIT FOR CONTROLLING DOUBLE ACTING FLUID OPERATING CYLINDERS

Herman Hohlein, Planckstrasse 10, Wolfsburg, Germany

Filed July 15, 1970, Ser. No. 54,915
Int. Cl. F15b *11/08, 13/043*
U.S. Cl. 91—459 **3 Claims**



A system comprising a fluid motor and a valve unit, said valve unit having a movable slide valve connecting in its end positions one side of a fluid motor to a fluid source under pressure and the other side of said fluid motor to a sump or to the atmosphere and connecting in its central position both sides of said fluid motor to said fluid source under pressure, said valve unit having a shifting slide and solenoid valves actuating said slide. After de-energizing said solenoid valves, said slide valve is caused to move into its central position so that the fluid motor is immediately supplied with fluid under pressure via passages containing excess pressure valves and the slide on

both sides and retained in every intermediate and end position.

3,780,624

ROTARY AIR MOTOR

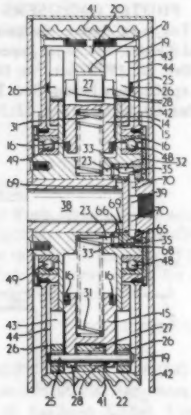
Frank Alan Webb, Twickenham, England, assignor to Martonair Limited, Middlesex, England

Filed Aug. 12, 1971, Ser. No. 171,236

Claims priority, application Great Britain, Sept. 21, 1970, 40,326/70

Int. Cl. F01b *13/00*

U.S. Cl. 91—491 **9 Claims**



In a rotary motor a plurality of radially-directed cylinders are located on a stator and include reciprocating pistons whose outer ends react with a cam track defined on the inner surface of a rotatable output member mounted coaxially with the stator, the pistons being driven pneumatically in a predetermined sequence by means of an air distribution arrangement in which two co-operating valve plates, one stationary and the other movable with the output member, operate between sources of air relatively high and low pressure and cylinder ports in the stator communicating with said cylinders.

3,780,625

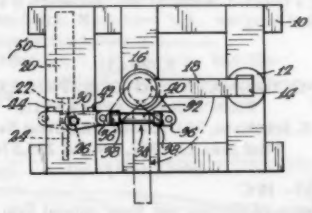
OPERATING MECHANISM FOR HIGH TENSION ELECTRIC SWITCH GEAR

Donald E. Weston, East Sebago, Maine, and Julius W. Timmerman, Brookfield, Wis., assignors to H. K. Porter Company, Inc., Chicago, Ill.

Filed Mar. 1, 1971, Ser. No. 119,549

Int. Cl. F15b *11/08*

U.S. Cl. 91—418 **5 Claims**



Operating mechanism for high tension electric switch gear comprising hydraulic cylinder means for reciprocating a rack, a pinion engaged with the rack for rotation thereby, and a three bar toggle linkage connected between said pinion and the rotary stack of the switch for operating the switch; said mechanism being characterized by its economy, compactness, foolproof operation, safety features and power.

3,780,626

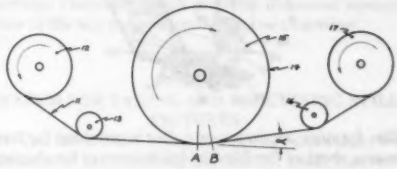
DEVICE FOR THINNING CELLULOSIC STRIPS

Joseph H. Hollier, Jr., Pearcy, Ark., assignor to Sutco, Inc., Hot Springs, Ark.

Filed July 25, 1972, Ser. No. 274,979

Int. Cl. B24b *19/22*; B26d *3/02*

U.S. Cl. 93—1 G **1 Claim**



An advancing cellulosic strip is caused to impinge tangentially upon the exterior, abrasive surface of a drum, which is rotatably mounted and driven on its longitudinal axis. The advancing cellulosic strip is urged into congruity with the exterior, abrasive surface of the drum over an area on the drum defined by an arc thereon of at least about 10°.

3,780,627

MACHINE FOR THE AUTOMATIC FORMATION AND INSERTION OF CONTAINER PARTITIONS

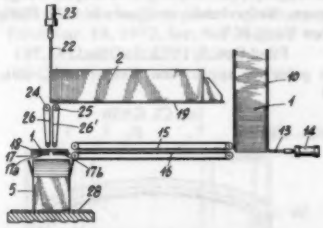
Emilio Roda, Noranco, Switzerland, assignor to Fratelli Roda S.A., Lugano, Switzerland

Filed Dec. 9, 1971, Ser. No. 206,319

Claims priority, application Switzerland, July 9, 1971, 10179/71

Int. Cl. B31b *11/26*, *11/02*

U.S. Cl. 93—37 R **6 Claims**

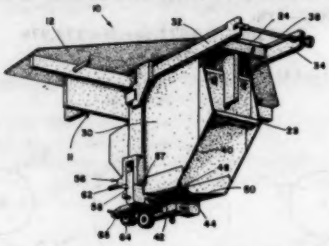


A machine for automatically manufacturing partition baffles forming "beehive" bodies adapted to separate various articles contained within a container, and for inserting said bodies into the respective containers having a first magazine containing the horizontal element piled therein, means to push an element into conveying members, a bending platform to receive said element conveyed by said members, a second magazine above said bending platform containing the vertical elements side by side, means to push said element into conveying and accelerating members which position said vertical elements into the elongated slots of said horizontal element, located on said bending table means to convey an embodied container below said bending platform and to hold said container while the "beehive" body is inserted, after which said container is advanced.

3,780,628
FILM SHAPING APPARATUS

Robert W. McGill, Stow, and P. Eric Painter, Northfield, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed Mar. 13, 1972, Ser. No. 234,089
Int. Cl. B31b 1/38; B65b 9/06
U.S. Cl. 93—82 10 Claims

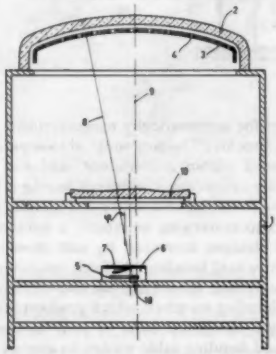


A film forming apparatus or collar is provided for having a continuous sheet of flexible film led thereover for shaping into an enclosure tube for receiving articles fed thereinto for packaging purposes and it includes a top plate having a trapezoidal form with a short front end and a wide rear end and forwardly converging side edges. Parallel side plates depend from the top plate and guide bar means are operatively positioned underneath the guide plate to fold the film around the side edges thereof as well as the front end of the guide plate, the film moving downwardly to be formed into the enclosure. A front roller is positioned at the front end of the guide plate and is adjustable in position to protrude forwardly or upwardly slightly from the front end of the guide plate and provide maximum tension on a center portion of the film as fed to and folded around the guide plate and downwardly over the front roller. The apparatus also includes a removable nose assembly on which the front roller is positioned and a second guide roller is positioned on such nose assembly with the center portion of the film passing down to and rearwardly around the second guide roller.

3,780,629
EXPOSURE DEVICE FOR MANUFACTURING A DISPLAY SCREEN OF A COLOUR TELEVISION DISPLAY TUBE

Piet Gerard Joseph Barten, and Eric Tapley Ferguson, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 293,781
Claims priority, application Netherlands, Oct. 14, 1971, 7114113
Int. Cl. G03b
U.S. Cl. 95—1 R 6 Claims

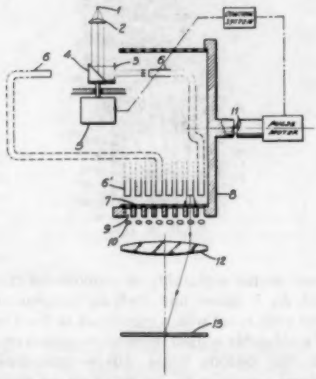


An exposure device for manufacturing a display screen of a colour television display tube. The device comprises a quasi-line-shaped light source and a diaphragm having a narrow slot. As a result of this combination a quasi-punctiform part of the light source is visible from the display screen. The shape of the slot is such that the quasi-puntiform part varies its position as a function of the deflection. This position variation is accomplished partly by varying the position of the virtual light source, which is necessary because of the actual shift of the deflection point in the operating tube. The rest of the position variation of the virtual light source is obtained by means of a correction lens system. A special shape of the slot is indicated.

3,780,630
LIGHT-DISTRIBUTION SYSTEM FOR PHOTOCOMPOSERS

Tohru Nakajima, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 28, 1970, Ser. No. 101,948
Claims priority, application Japan, Dec. 26, 1969, 44/2135
Int. Cl. B41b 21/08, 21/26
U.S. Cl. 95—4.5 3 Claims



A system for directing light in a photocomposer to a selected character to participate in the formation of an image thereof. The photocomposer has a maxtrix provided with characters uniformly arranged in rows which are adapted selectively to be positioned at a projecting position where a selected character in the row at the latter position can have its image projected onto a light-sensitive member. A plurality of elongated light-guide members are respectively provided with light-discharge ends respectively aligned with the characters in a row at the projecting location, and these light-guide members have light-receiving ends distant from their light-discharge ends. A single light source is provided for illuminating a selected character, and a light-directing structure coacts with this single light source to direct light therefrom to the receiving end of a selected light-guide member, so that light will travel therethrough to the discharge end thereof for illuminating a selected character in a row which is at the projecting location.

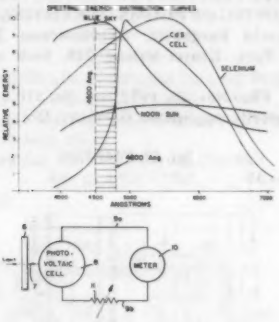
3,780,631
MONOCHROMATIC PHOTOGRAPHIC EXPOSURE PROCESS AND APPARATUS

Norman S. Schulman, 55 Grist Mill Ln., Great Neck, N.Y.

Filed June 23, 1972, Ser. No. 265,574
Int. Cl. G01j 1/00
U.S. Cl. 95—10 C 7 Claims

A process of filtering out from natural light that light of wave lengths greater than about 4800 angstroms and less than about 4500 angstroms, directing the filtered light of about 4500 to about 4800 angstroms onto a photosensitive cell and metering the response of the photosensitive cell and directly proportional to the metered response, controlling light expo-

sure to an image-receiving mechanism such as a television-image-receiving tube or a camera film, typically by controlling shutter speed and/or by controlling iris-aperture diameter of the camera, and the controlling of the light exposure may be



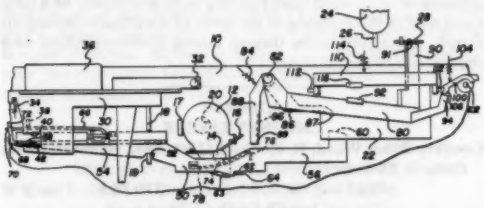
either calculated on the basis of a meter reading or may be automatic through electrical circuits, whereby compensation is made for variations in spectral quantity of light source as well as compensation being thereby made for various reflectiveness of subject matter being metered.

3,780,632

DAYLIGHT MODE COMPENSATING MECHANISM

Leonard F. Kamp, and Jeffrey R. Stoneham, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,538
Int. Cl. G03b *15/04*
U.S. Cl. 95—11 L **10 Claims**



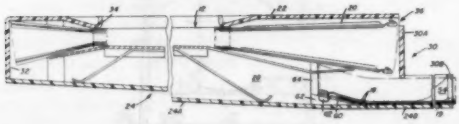
Photographic apparatus having a shutter mechanism and adapted for use with a flash device is provided with a compensating spring for equalizing the force required to actuate the mechanism in the daylight and flash mode.

3,780,633

FILM CARTRIDGE

Chester W. Michatek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 5, 1972, Ser. No. 268,939
Int. Cl. G03b *19/10*
U.S. Cl. 95—19 **9 Claims**



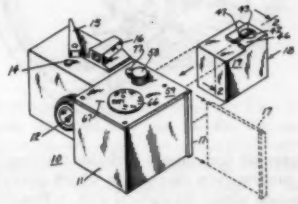
An improved cartridge for a plurality of photographic film units of the self-processing type wherein the film units each include an image-recording unit releasably coupled at the leading end to a leading member which comprises elements that can be separated from the finished photographic print and constitute waste that must be disposed of. The cartridge comprises a substantially rectangular container having an exposure aperture in one surface. The cartridge is provided with a trailing and a leading end, the leading end being provided with a film unit dispensing slot for the removal of an exposed image-recording unit from the cartridge. The lower portion of the leading end of the cartridge extends beyond the portion containing the dispensing slot and is arranged to accept and retain the leading member as it is separated from the image-recording unit. The improvement comprises wall elements in the cartridge extension which provides improved storage and retention of the separated members in the extension.

3,780,634

SYSTEM FOR TAKING AND PROCESSING STILL PICTURES

John H. Van Osch, 3415 Honey Creek Ct., Milwaukee, Wis.

Division of Ser. No. 501,321, Oct. 22, 1965, Pat. No. 3,653,310. This application Mar. 27, 1972, Ser. No. 238,696
Int. Cl. G03b *17/26*
U.S. Cl. 95—31 CA **18 Claims**



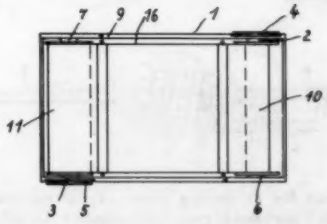
This invention relates to photography and in particular to an improved photographic system for taking and processing still pictures.

3,780,635

SPOOL HOLDER FOR ROLL FILM CAMERAS

Claus Prochnow, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Apr. 14, 1972, Ser. No. 244,099
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 CA **9 Claims**



A spool holder for holding a roll film supply spool and take-up spool, the holder with the spools mounted therein being insertable in or removable from an appropriate camera body constructed to receive it, or a detachable back section or cassette section of a camera body. The holder contains driving keys and mounting pins or stub shafts for both spools, the driving keys being at diagonally opposite corners of the holder. Thus the holder may be inserted in the camera body in either one of two positions, rotated 180° with respect to each other about the optical axis. When the film on the supply spool has been used up, the former supply spool now becomes the take-up spool when the holder is inserted in the camera in a posi-

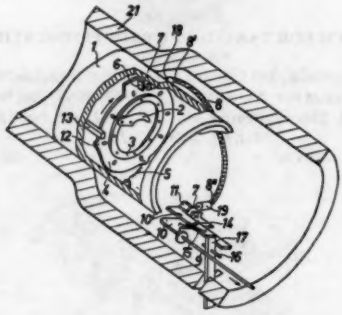
tion turned 180° from its former position, thus avoiding the customary step of removing the empty supply spool and re-inserting it in the camera in the take-up position.

3,780,636

DEVICES FOR OPERATING A SPRING AND PRESSURE CONTROLLED PRESELECTION DIAPHRAGM IN PHOTOGRAPHIC LENS MOUNTS

Paul Klupsch, 23, Am Johannisberg; Rudolf Paul, 14, Thomas-Mann-Strasse, and Ulrich Dressler, 6, Geleitsstrasse, all of Jena, Germany

Filed Mar. 11, 1969, Ser. No. 806,325
Int. Cl. G03b *9/02*
U.S. Cl. 95—64 R **2 Claims**



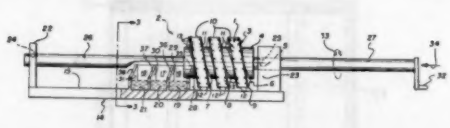
A photographic lens mount includes a spring and pressure controlled preselection diaphragm which participates in the focusing motion along the optical axis, a Bowden cable, and means for actuating the diaphragm. Part of the actuating means projects from the lens mount into the camera. The Bowden cable connects the actuating means with the diaphragm and controls the diaphragm setting by push and pull.

3,780,637

PHOTOGRAPHIC MATERIAL PROCESSING APPARATUS

Robert F. Horn, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1972, Ser. No. 232,387
Int. Cl. G03d *3/06*
U.S. Cl. 95—93 **7 Claims**



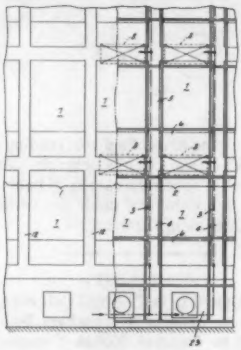
Apparatus for processing photographic material by immersing such material in processing solution, includes a screw member which is provided with a shank having a longitudinally extending axis and with a rib projecting from the shank and helically disposed about the shank axis so as to form a series of uniformly spaced rib convolutions. The rib convolutions are adapted to hold a flexible strip of photographic material in a helical winding. A frame member of the apparatus is provided with a base which supports several processing solution tanks in fixed, aligned relation. The frame member is further provided with other structure which supports the screw member for rotation about the shank axis and for translation in a manner such that the rib convolutions depend into, and move successively through, the tanks. A screw-mating member of the apparatus is located on the frame and adapted to be received between the rib convolutions for effecting translation of the screw upon screw rotation about the shank axis.

3,780,638

CONSTRUCTION FOR THE VENTILATION AND AIR CONDITIONING OF ROOMS OF EXISTING BUILDINGS

Ernst Albrecht Burghartz, Isabellastrasse 29, and Hans Guenter Fuss, Krayer-Strasse 218, both of 4300 Essen, Germany

Filed Nov. 28, 1972, Ser. No. 310,137
Claims priority, application Germany, Dec. 3, 1971, P 21 60 012.4
Int. Cl. F24f *7/00*
U.S. Cl. 98—31 **10 Claims**



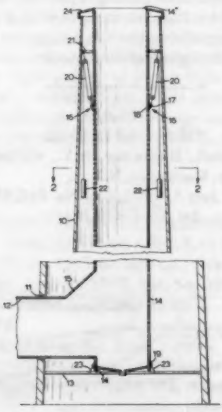
Ventilation and air conditioning system for heating, cooling and ventilating existing buildings, which avoids the necessity of breaking through the walls, floor or ceiling of the building for the provision of air supply and exhaust ducts. This systems consists of an air-tight false building wall, which may be a false front wall of the building in the form of a subframe having air supply and return ducts therein having communication with the interior of the building.

3,780,639

CHIMNEY LINERS

Geoffrey Brian Wood, R. R. No. 1, 18th Ave., Richmond Hill, Ontario, Canada

Filed July 11, 1972, Ser. No. 270,863
Int. Cl. E04h *12/28*
U.S. Cl. 98—58 **10 Claims**



A tubular chimney liner is supported within the outer tubular shell of a chimney structure by tensioning means con-

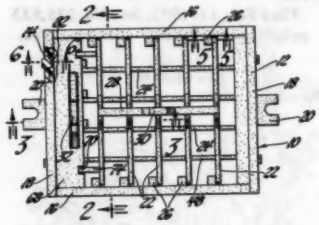
nected between the liner and the shell for applying an upward force to the liner in excess of its weight, and tethering means connected to the liner adjacent to its bottom end for maintaining the bottom end of the liner in a substantially constant position. The liner is thus supported under longitudinal tension, and changes in length due to thermal changes are taken up at its upper end.

3,780,640

COMPOUND AIR REGISTER OF ONE PIECE CONSTRUCTION

Jonathan N. Fruth, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 18, 1972, Ser. No. 272,993
Int. Cl. F24f *13/08*
U.S. Cl. 98—110 **3 Claims**



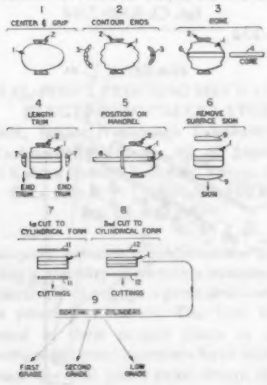
A compound air register of one-piece molded plastic construction, in preferred form of molded polypropolene, including integraly connected frame members one being pivotally folded within the other, the respective frame members each including a plurality of vanes forming a vane set integrally molded therewith and capable of pivotal movement relative thereto. The vanes in the one frame vane set rotate about an axis normal to the axis of rotation of the vanes in the other frame vane set. When folded together the vanes in the one frame vane set are positioned normal to the vanes in the other frame vane set controlling the flow of air in both vertical and horizontal planes. Actuating means are also molded integral with the respective pluralities of vanes so that they may be rotated in unison as desired.

3,780,641

METHOD FOR PREPARING PINEAPPLE

William L. Hole, 23 Brookdale Ct., Lafayette, Calif.

Filed Dec. 6, 1971, Ser. No. 204,912
Int. Cl. A23n *7/00*; B23q *3/08*; A47i *17/10*
U.S. Cl. 426—482 **15 Claims**



Method and apparatus for preparing fresh pineapple and like fruit prior to slicing and canning or freezing such fruit. Whole pineapple are gripped in sequence intermediate their ends while skin is removed from such ends, after which their core is removed. Following trimming to predetermined length the external grip is released and the pineapple are supported internally while the remaining skin is removed and the pineapple are cut to cylindrical form of predetermined diameter. The removed skin, core and meat cuttings are utilized to the maximum extent to insure minimum waste in an economical procedure.

3,780,642

CASSEROLE

Eduard Bay, Hohlstrasse 26, 5412 Ransbach-Baumbach, Germany

Filed Feb. 11, 1972, Ser. No. 225,463
Claims priority, application Great Britain, Oct. 29, 1971, 20,402/71
Int. Cl. A47j *37/10*
U.S. Cl. 99—347 **7 Claims**

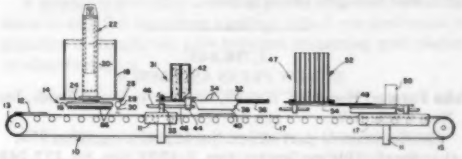
A casserole in which the container for the food is formed of porous ceramic material and the lid for the container is formed of impervious material. The underside of the lid is provided with a plurality of spaced, depending ribs. During cooking, condensate collecting on the underside of the lid drips from the ribs onto the food in the casserole.

3,780,643

PASTRY SHELL FILLING APPARATUS

Imre F. Papai, 2818 E. 119 St., Cleveland, Ohio

Filed May 8, 1972, Ser. No. 250,933
Int. Cl. A21c *11/16*; A23g *3/02*
U.S. Cl. 99—450.7 **7 Claims**



There is provided a new pastry filling machine characterized by an indexing conveyor belt adapted to receive unfilled pastry shells, e.g., partially baked pizza pie shells, for delivery sequentially to filling stations, e.g., a tomato paste applying station, a grated cheese applying station, and a pepperoni applying station. Each of the material dispensers included at the indexed stations is also novel and may be used alone or in combination with one or more of the others.

The apparatus for applying a paste-like foodstuff is characterized by a distribution head of unique construction and having a manifold chamber and a plurality of individual distributing orifices of predetermined increasing opening as the distance from the center of the head increases. The length of the spouts and the magnitude of the hydrostatic head within the distribution head is interrelated in such a way that dripping of residual material is avoided.

The apparatus for applying a grated foodstuff, e.g., cheese from brick cheese bodies, is characterized by a movable holder for gravity or forced feeding of the foodstuff and a stationary grate.

The apparatus for applying a sliced meat product includes relatively movable rotatable cutting means and meat supporting means, and means for guiding meat slices to a predetermined location on a pastry shell.

3,780,644

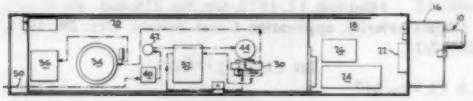
MILK PROCESSING SYSTEM

Richard Canfield, R. D. No. 1, Manheim, Pa., and Nelson Naftziger, R. D. No. 3, Coatesville, Pa.

Filed Jan. 24, 1972, Ser. No. 220,324

Int. Cl. A01j *11/00*

U.S. Cl. 99—455 **9 Claims**



A novel milk processing system is disclosed which generally comprises a mobile milk processing unit mounted on a motor vehicle and by which raw milk can be processed and discharged directly at the farm, for example. In the preferred disclosed structural embodiment, the mobile unit for processing raw milk directly at the location of a source of supply thereof comprises a movable vehicle which has disposed thereon a milk processing assembly including at least a pasteurizer, means for delivering raw milk to the pasteurizer and for discharging processed milk therefrom, means for circulating water as a heat transfer medium through the pasteurizer, and electrically operable temperature conditioning means for selectively heating and cooling the circulating water. The mobile unit further carries an electrical generator which, in the preferred inventive embodiment, is itself driven by the motor of the movable vehicle, or by an auxiliary motor the vehicle being contemplated to comprise a tractor/trailer combination. The electrical generator provides electric power for operating at least the milk processing assembly and the temperature conditioning means disposed on the vehicle. By so utilizing an electrical generator as the power source, marked savings in economy, size, and weight can be achieved over conventional steam-operated apparatus and related machinery, thus enabling production of a commercially feasible mobile milk processing system.

3,780,645

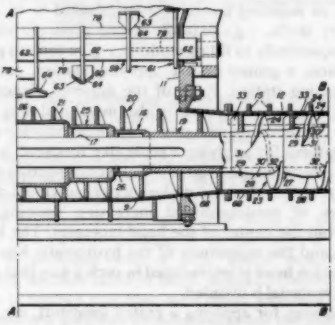
SCREW PRESS ASSEMBLY

John Farmer, Honolulu, Hawaii, assignor to Ward Foods, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 65,447, Aug. 20, 1970, abandoned. This application Aug. 2, 1972, Ser. No. 277,248

Int. Cl. B30b *9/12*

U.S. Cl. 100—117 **31 Claims**



A screw press assembly for expressing juice from bagasse and other disintegrated juice-containing material, having an upwardly opening hopper feeding a plurality of barrels, through each of which bagasse is driven by a screw extending into the hopper, and means in the inlet of the hopper for preventing accumulation of the material in advance of and distributing it uniformly over the screws. Within the barrels, the screws are so constructed as to produce a relatively low radial force and concentrate the pressure at the barrels' outlets and that pressure is controlled by axially shiftable, fluid-actuated plugs in the outlets. The barrels have bell-mounted inlets for minimum interference with entry of the material and are perforated throughout their lengths for passing expressed juice and the screws are intergeared for driving all through a drive connected to one.

3,780,646

FIBROUS SUBSTANCE COMPRESSION APPARATUS

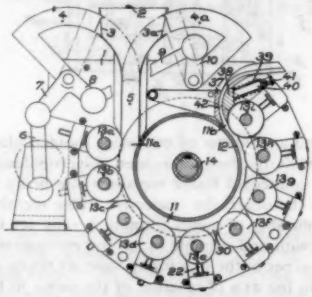
Marcel Ancellin, Paris, France, assignor to Societa FFSA, Paris, France

Filed Feb. 11, 1972, Ser. No. 225,533

Claims priority, application France, Feb. 19, 1971, 7105790

Int. Cl. B30b *3/04*

U.S. Cl. 100—155 **5 Claims**



In apparatus for compressing fibrous substances, e.g. hay or other catle cattle into caked form, the substance is squeezed or compressed through a conduit of circular shape and whose cross-section decreases from its inlet to its outlet. The conduit is defined by a central wheel and a plurality of satellite rollers peripherally distributed therearound and the spacing of the satellite rollers from the central wheel decreases progressively from the inlet end to the outlet end.

3,780,647

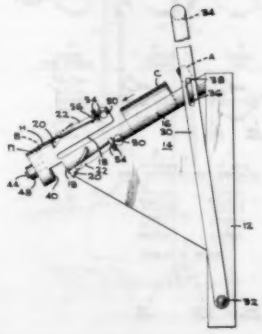
CONTAINER FLATTENING APPARATUS

James L. Reimers, Saratoga, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 25, 1972, Ser. No. 292,052

Int. Cl. B30b *7/04*

U.S. Cl. 100—232 **8 Claims**



A can flattening apparatus has four diagonal creasing blades that are pressed into the cylindrical wall of the can through a

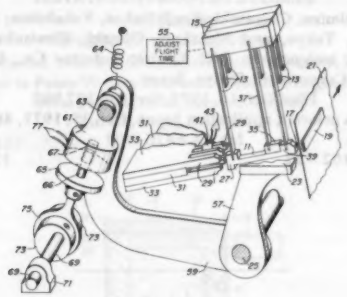
housing, whereupon the can is flattened by axial compression between an anvil and rotatable base in the housing.

3,780,648

HIGH SPEED PRINT HAMMER WITH DYNAMIC DAMPER MEANS

Robert H. Curtiss, Wayland; Richard Holzman, and Seldan A. Lazarow, both of Framingham, all of Mass., assignors to Nortec Computer Devices Inc., Ashland, Mass.

Filed Sept. 2, 1969, Ser. No. 854,531
Int. Cl. B41j *5/23*
U.S. Cl. 101—93 C **11 Claims**



A hammer for impact printers having a hammer arm with a striking face mounted for movement toward and away from type to cause a document located between the hammer face and type to be printed when the hammer arm is propelled toward the type. The hammer arm is supported by two spring reeds and is cocked away from the printing position against a permanent magnet. Printing is effected by opposing the permanent magnetic field with an electromagnetic field to release the cocked hammer arm. The spring reeds cause the hammer to be propelled toward the type. A dynamic damper supported by another spring reed is cocked with the hammer arm. The natural frequency of the damper is lower than that of the hammer arm, causing the damper to strike the rebounding hammer arm after printing. The energy in the rebounding hammer arm is absorbed by the impact of the damper to reduce oscillations in the hammer arm.

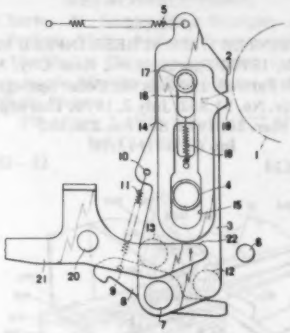
3,780,649

DECIMAL-POINT PRINTING MECHANISM FOR ELECTRONIC CALCULATOR

Masaaki Oishi, Tokyo; Yoshinaga Takahashi, Yachiyo, and Keiichi Yoshizawa, Matsudo, all of Japan, assignors to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed July 8, 1971, Ser. No. 160,685
Int. Cl. B41j *1/16*
U.S. Cl. 101—93 C **3 Claims**

A decimal-point printing mechanism for an electronic calculator having a plurality of rockably mounted print hammers actuated selectively to engage a print drum or roll having type thereon for printing numerals. The type includes decimal points printed in their proper place in a multi-numeral number. Some of the print hammers have slidably disposed on a side thereof decimal point print levers that are actuated selectively from a rest position in which they are ineffective during the printing action of the respective print hammers. Selector mechanism is provided for selectively actuating individual decimal-point print levers to a raised position on the associated hammers for disposing the print heads thereof in



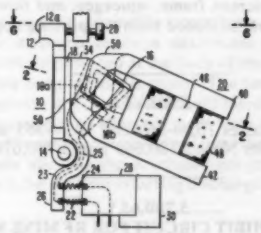
position for printing a respective decimal point simultaneously with the printing effected by the associated print hammers.

3,780,650

PRINT HAMMER WITH MOVING COIL

Johann Hans Meier, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,512
Int. Cl. B41j *7/08*
U.S. Cl. 101—93 C **5 Claims**



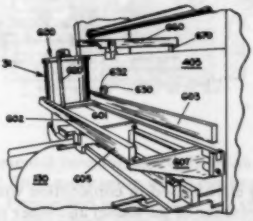
A printer is provided with a plurality of pivoted print hammers having flat operating windings which are positioned in a plurality of parallel air gaps between projecting pole pieces of an electromagnet.

3,780,651

SCREEN PRINTER INK SUPPLY WITH QUICK COUPLING AND LEVEL SENSING

James A. Black, 13700 Sparta, N.W., Kent City, Mich., and Harry Russell Farwell, 129 Ann St., Cedar Springs, Mich.

Division of Ser. No. 51,852, July 2, 1970. This application Mar. 20, 1972, Ser. No. 236,135
Int. Cl. B41f *31/00*
U.S. Cl. 101—115 **7 Claims**



A stencil screen printing press assembly including a pressurized ink supply means having a sensor and a control valve operably connected thereto. The sensor and control valve

serve to cooperatively maintain a predetermined optimum ink level in the stencil screen.

3,780,652

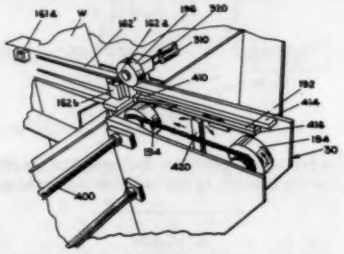
SCREEN PRINTER WITH SCREEN INFEED MEANS

James A. Black, 13700 Sparta, N.W., Kent City, Mich., and Harry Russell Farwell, 129 Ann St., Cedar Springs, Mich.

Division of Ser. No. 51,852, July 2, 1970. This application Mar. 20, 1972, Ser. No. 236,482

Int. Cl. B41f *15/10*

U.S. Cl. 101—124 **12 Claims**



Stencil screen printing apparatus having at least one printing station and means for advancing continuous web stock through the printing station. Releasable stencil frame retention means are provided at the printing station each shiftable between clamping and releasing conditions such that a combination stencil screen frame, squeegee, and flow coater can be loaded into and unloaded from the printing apparatus with ease.

ERRATA

For Classes 102—269 and 101—363 see:
Patents Nos. 3,780,669 and 3,780,670

3,780,653

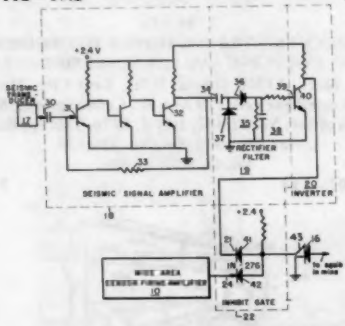
SEISMIC INHIBIT CIRCUIT FOR RF MINE SENSOR

Raymond G. Stinchcomb, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 7, 1971, Ser. No. 178,445

Int. Cl. F42b *23/26, 21/38*

U.S. Cl. 102—19.2 **10 Claims**



An inhibiting circuit used in conjunction with a means for detecting the presence of personnel and other moving objects and detonating a mine proximate thereto. The circuit includes a seismic transducer positioned to detect vibrations of relatively heavy moving objects and provide an output signal responsive to such movement, which is then amplified, rectified, filtered, and inverted. The inverted output, which is at ground level only when a seismic signal is present and at some positive level at all other times, is applied to one input of an inhibit gate. The other inhibit gate input is derived from the output of said detecting means which consists of a positive signal when it detects a moving object. The output of the gate is connected to the control element of a silicon controlled rectifier that in turn is connected to detonate a selected land mine. Thus, the mine will only be detonated upon receipt of the positive output of the gate which is dependent on having applied thereto a pair of positive inputs. Such inputs are only present in the absence of a seismic signal and in the presence of a moving object. Therefore the mine cannot be detonated by a large, heavy, moving object such as a tank.

3,780,654

REMOTE DETONATION SYSTEM

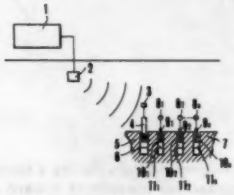
Ryozi Shimizu, Chigasaki; Kenji Nakao, Yokohama; Masaaki Oguri, Tokyo, and Masakatu Ohgaki, Hiratsuka, all of Japan, assignors to OKI Electric Industry Co., Ltd. and Taisei Corporation, Tokyo, Japan

Filed Oct. 16, 1972, Ser. No. 297,985

Claims priority, application Japan, Oct. 15, 1971, 46/80970

Int. Cl. F42d *3/00*

U.S. Cl. 102—22 **11 Claims**



In a remote detonation system wherein a plurality of underwater explosives are detonated simultaneously by command signals sent from a remote control station, there are provided a control station including an oscillator for generating a plurality of frequency modulated waves and a sound wave transmitter for transmitting the frequency modulated waves through the water as frequency modulated command signals; a plurality of detonation control elements, each including a sound wave receiver for receiving the frequency modulated command signals from the control station, means for demodulating the output from the sound wave receiver for reproducing the frequency modulated command signals and ignition means including a plurality of switches which are operated sequentially by the output of the demodulating means; a plurality of electric detonators each connected to the ignition means of the detonation control elements, and a plurality of underwater explosives detonated by the detonations of respective electric detonators.

3,780,655

SIGNALING DEVICE

Robert A. Allen, Tonawanda, and Elmore L. Bement, Buffalo, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

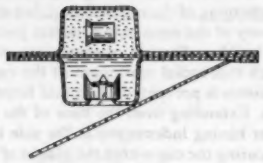
Filed Feb. 24, 1969, Ser. No. 802,308

Int. Cl. F42b *23/00*

U.S. Cl. 102—31 **7 Claims**

This invention relates to a sealed multicompartment signaling device, each compartment containing at least one material

which is mixed with the material of the other compartment upon puncturing of the seal by a member contained in one of



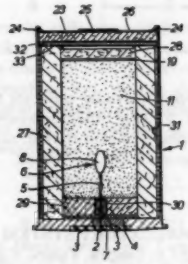
the compartments, as the result of an external force on the device.

3,780,656

PYROTECHNIC DEVICES

Dudley Charles Murray, Homington, near Salisbury, England, assignor to Pains-Wessex Limited, Wiltshire, England

Filed June 4, 1970, Ser. No. 43,483
Int. Cl. C06d *1/04, 1/10*
U.S. Cl. 102—37.6 6 Claims



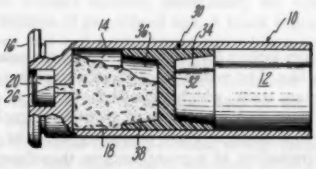
A pyrotechnic signal device which comprises a discharge tube, a rupturable casing which is housed within the discharge tube and which contains flash-producing composition, and electrically-operated means for igniting the pyrotechnic composition that includes contacts on the outer surface of the discharge tube.

3,780,657

FRANGIBLE PROJECTILE

Melvin Zaid, Old Westbury, N.Y., assignor to Colt's Inc., Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 183,967
Int. Cl. F42b *5/22, 11/38*
U.S. Cl. 102—41 10 Claims



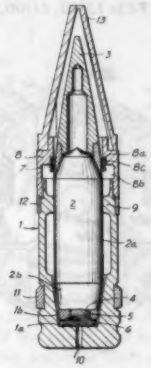
A bullet assembly with a projectile body formed of a low mass frangilbe material lethal over a limited effective range and which may be provided with an obturator between the projectile body and a propellant charge.

3,780,658

UNDERSIZED-CALIBER PROJECTILE WITH DETACHABLE SABOT

Jacques Charles de Longueville, Bourges; Jacques Felix Charles Perfetti, Vichy, both of France, and Ernst Jakob Kessler, Muellheim, Germany, assignors to Etat Francais represente par le Ministre d'Etat Charge de la Defense Nationale, Paris, France

Filed Sept. 3, 1971, Ser. No. 177,573
Int. Cl. F42b *11/14*
U.S. Cl. 102—52 7 Claims



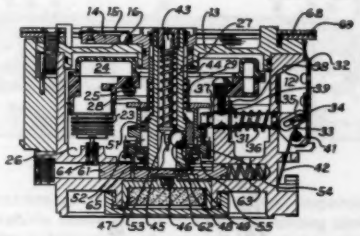
An armor-piercing projectile comprising an undersized-caliber core arranged inside a detachable sabot or shoe, wherein a cavity is provided at the back of the core in which a gas generating composition, is seated. The base of the shoe is provided opposite this cavity with a calibrated orifice having a sectional area such as to allow hot gases from a powder charge to pass from the associated casing to ignite the discharge composition, while allowing the developed gas pressure from the composition to be used for effecting discharge.

3,780,659

ENVIRONMENTAL FUZE FOR PYROTECHNIC DEVICE

Stanley Kulesza, Brooklyn, and Max Sapsowitz, Bronx, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1972, Ser. No. 298,731
Int. Cl. F42c *5/02*
U.S. Cl. 102—70 B 4 Claims



An environmental fuze for use with an air-dropped store having a timed firing mechanism which can be set for different time intervals. Fuze action is initiated by one or more dynamic pressure sensing fins which, upon actuation, initiates a timing mechanism and seals a bellows assembly. The bellows assembly monitors the increase of atmospheric pressure as the store falls and if a predetermined pressure change occurs within a given time period, the firing pin is released to

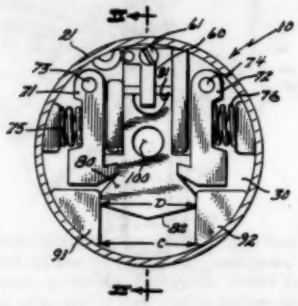
detonate a primer. In the event that the desired pressure change does not occur during a given time interval, the timing mechanism will jam and the fuze will remain in a safe condition.

3,780,660

MULTIPLE FUNCTION SAFE AND ARM MECHANISM

George Webb, and Bernard L. Malott, both of Richmond, Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1971, Ser. No. 118,012
Int. Cl. F42c *13/00, 11/00, 15/22*
U.S. Cl. 102—70.2 R **5 Claims**



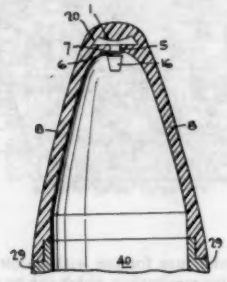
A safe and arm mechanism for use with a proximity fuze which uses an active battery and which is armed by spin. The mechanism includes an electric detonator which is short-circuited and misaligned with respect to a lead when the mechanism is in an unarmed position, and a battery switch which is off when the mechanism is in an unarmed position. Spinning causes the arming weights in the mechanism to rotate and to release a slider which removes the short-circuit, brings the lead into alignment with the electric detonator, and causes the battery switch to turn on the battery to fully arm the fuze.

3,780,661

PROTECTIVE METAL CAP FOR PLASTIC FUZE RADOMES

Samuel A. Clark, Jr., Wheaton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 30, 1972, Ser. No. 267,886
Int. Cl. F42c *13/04, 13/00, 19/00*
U.S. Cl. 102—70.2 P **10 Claims**



In combination with a plastic fuze radome, a structure for protecting the internal electronic components housed within said fuze during flight said structure being a metal cap immersed in the forward tip of the radome and having a concave frontal indentation for reducing the droplet flow of impinging rain and other fluid around the cap, whereby the immersion of the metal cap in the plastic material of the radome prevents relative movement of the cap with respect to the components and thus avoids malfunctioning of the fuze via this disturbance and whereby the metal cap having a plastic coating avoids triboelectric charging of the radome, and, because of the thermal conductivity of the metal cap provides protection against surface heat buildup. Several openings are provided in the metal cap such that radial movement of the cap with respect to the components is prevented when said fuzes are subjected to spin forces. Extending from the base of the metal cap is a finger member having indentation in the side thereof for the purpose of securing the cap within the plastic of the radome.

3,780,662

RADAR REFLECTOR DEPLOYMENT METHOD

Glenn P. Sorenson, 148 Los Cerras, Walnut Creek, Calif.

Continuation-in-part of Ser. No. 256,549, Feb. 6, 1963, abandoned. This application Sept. 1, 1965, Ser. No. 485,672
Int. Cl. F42b *13/56;* **H01q** *17/00*
U.S. Cl. 102—89 **10 Claims**

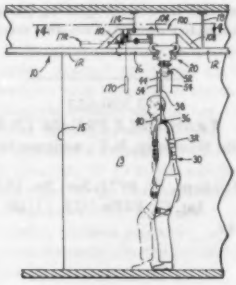
1. A device for deploying radar reflector material comprising a spinner rocket, a radar reflector wound about substantially the entire periphery of said rocket, said radar reflector including a monofilament fiberglass thread.

3,780,663

AMBULATORY SYSTEM

Marshall G. Pettit, 255 E. Sandra, Tulare, Calif.

Filed Jan. 31, 1972, Ser. No. 221,950
Int. Cl. B61b *13/00*
U.S. Cl. 104—1 R **14 Claims**



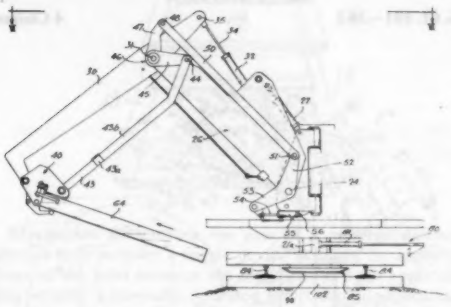
An ambulatory system for use by debilitated ambulatory patients and the like. The system consists of a track network including a primary track, which extends the length of communicating corridors, and a plurality of secondary tracks, each extending from a point in close proximity with the primary track, and terminating at a point remote therefrom, and a travelling truck, supported by the track network, having a harness depending therefrom for substantially supporting the weight of a human body in suspension for assisting the patients in walking along the corridors as well as to enter and depart from various areas through which the secondary tracks are extended.

3,780,664

MACHINE FOR INSERTING TIES BENEATH A RAILROAD TRACK

John D. Holley, Montgomery, Ala., and Richard A. Peppin, Minneapolis, Minn., assignors to Mannix Construction, Inc., Minneapolis, Minn.

Filed May 30, 1972, Ser. No. 257,888
Int. Cl. E01b 29/10
U.S. Cl. 104—9 3 Claims



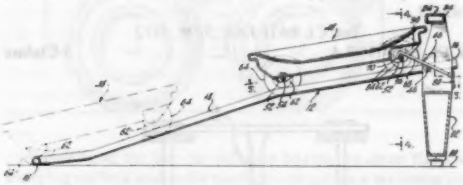
Ties dumped on the rails are withdrawn individually outwardly of the track by a tie clamp mechanism mounted on a jib supported by a boom extending laterally from an on-track vehicle. A pantograph system controls the orientation of the tie clamp mechanism, which grasps each tie firmly. This arrangement enables each such grasped tie to be pushed under the track by an inward swing of the jib.

3,780,665

ROLLER COASTER

Raymond J. Lohr; James Smith, and Lowell L. Bennett, all of Erie, Pa., assignors to Louis Marx & Co., Inc., New York, N.Y.

Filed Apr. 12, 1971, Ser. No. 133,100
Int. Cl. A63g 21/04
U.S. Cl. 104—69 12 Claims



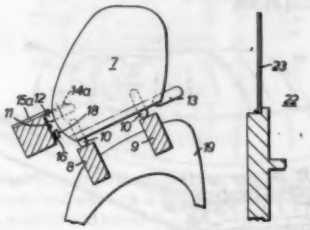
A roller coaster suitable particularly for young children such as children of pre-school age. A track is provided with a lower front end and a rear upper end while a vehicle is provided for free movement gravitationally down the track from its rear upper end toward its lower front end. A supporting structure supports the rear upper end of the track at the required elevation, this supporting structure also serving to support a releasable holding element which releasably holds a vehicle at the rear upper end of the track while a child climbs into the vehicle. A manually operable member is accessible to the occupant of the vehicle for displacing the holding member to a non-holding or release position, so that when the occupant desires the vehicle can be released for movement down the track.

3,780,666

TRANSPORTATION

Francis Cyril Perrott, c/o The Manor House, South Cerney, Cirencester, Gloucestershire, England

Filed June 28, 1971, Ser. No. 157,102
Claims priority, application Great Britain, July 24, 1970, 36,010/70; Nov. 9, 1970, 53,099/70
Int. Cl. E01b 25/26
U.S. Cl. 104—88 21 Claims



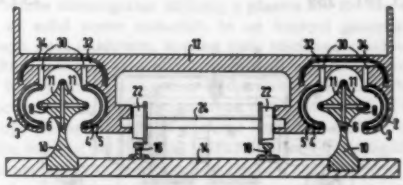
Means of transportation comprise a track and vehicle guided along the track with the self-routing faculty of track selection. That is to say, two stationary guides are positioned at each branch of the track, and each vehicle carries means to select one or other of the guides and hence to follow one or other of the alternative routes at each track branch. For optimum track utilisation the vehicles, particularly at busy traffic periods, are grouped so that a plurality of vehicles run as a "-contact train" with the individual vehicles in each group in contact one with the next. Although in contact they remain separate, so that at each branch any vehicle is free to follow the chosen or preprogrammed route at that branch.

3,780,667

ELECTRO-MAGNETIC SYSTEM FOR THE GUIDED SUSPENSION OF A MOVING VEHICLE

Jurgen Miericke, Nurnberg; Hans Hieronymus, Erlangen, and Franz Pawlitschek, Neunhof, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 3, 1972, Ser. No. 277,612
Claims priority, application Germany, Aug. 6, 1971, P 21 39 506.2
Int. Cl. B61b 13/08
U.S. Cl. 104—148 MS 16 Claims



An electromagnetic system for the guided suspension of a moving vehicle above a track or roadbed utilizing along each side of the vehicle pairs of opposed superconducting loops defining elongated tubular cavities therebetween, and a pair of arrays of independent elongated inductive suspension and guidance loops disposed in cruciform arrangement with the suspension loops generally horizontal and the guidance loops generally vertical, the cavities of the vehicle adapted to receive the respective arrays of loops during traverse of the vehicle along the roadbed, whereby the vehicle is suspended above the roadbed by the induced suspension field and guided along the roadbed by the induced guidance field.

3,780,668
ELECTROMAGNETIC SUSPENSION AND/OR GUIDE SYSTEM ESPECIALLY FOR MAGNETICALLY SUSPENDED VEHICLES

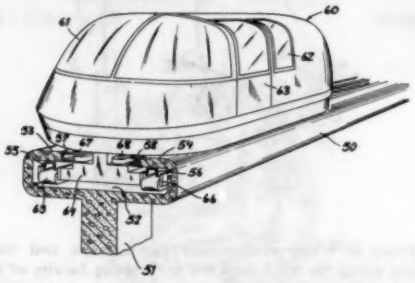
Peter Schwarzler, Furstenfeldbruck; Gerhard Bohn, and Helmut Schauberger, both of Munich, all of Germany, assignors to Krauss-Maffei AG, Munich, Germany

Filed Aug. 11, 1972, Ser. No. 280,073

Claims priority, application Germany, Sept. 7, 1971, P 21 46 143.8

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **10 Claims**



An electromagnetic suspension and guide system for magnetically suspended vehicles comprises a support or track along which the vehicle is displaceable and is provided with an armature rail of magnetically permeable material (e.g., a ferrous metal), while the vehicle is provided with at least one electromagnet cooperating with this armature rail. The electromagnet has a core of U-profile, the arms or shanks of which reach toward the armature rail which is likewise of U-profile whose shanks reach toward the electromagnet. The shanks of these two members overlap and the shanks of one member are inclined toward the shanks of the other. The shanks of the armature member may reach into the space between the shanks of the core member or vice versa.

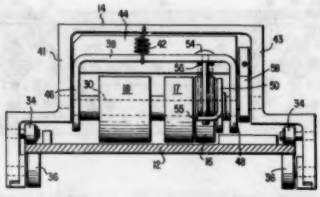
3,780,669
IMPRINTER HAVING INDEPENDENTLY MOUNTED, PRELOADED PRINT ROLLERS

Franklin O. Geiger, Manassas, and James L. Young, Alexandria, both of Va., assignors to Farrington Business Machines Corporation, Springfield, Va.

Filed July 1, 1971, Ser. No. 158,944

Int. Cl. B41f *3/04*

U.S. Cl. 101—269 **23 Claims**



An imprinter for imprinting a plurality of fields on a document having at least two independently mounted print rollers for respectively imprinting the two fields where both print rollers are in printing position when the print rollers are moved in a predetermined direction with respect to the print bed during imprinting whereby interaction between the print rollers is minimized as they imprint at their respective fields on the document. At least one of the print rollers is preloaded and set to a minimum distance from the print bed so that the preloaded print roller raises from the print bed as raised characters on the printing plate are encountered whereby automatic compensation is provided for characters of varying height associated with the preloaded print roller.

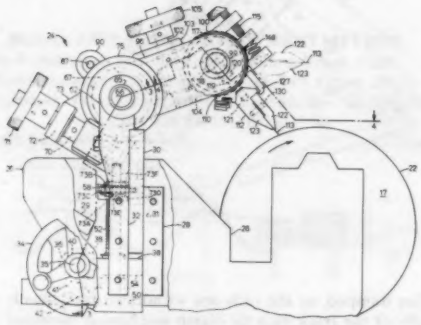
3,780,670
DOCTOR BLADE ASSEMBLY

Norman C. Abler, Milwaukee, and David R. Hardt, Menomonee Falls, both of Wis., assignors to Faustel Incorporated, Butler, Wis.

Filed Aug. 7, 1972, Ser. No. 278,442

Int. Cl. B41f *31/04*

U.S. Cl. 101—363 **4 Claims**



A doctor blade assembly for holding a doctor blade which wipes excess ink from an etched or engraved ink applicator roll in a printing press enables the blade to be moved to a variety of positions with respect to the roll, imparts a reciprocating motion to the blade, enables skew adjustment of the blade, and clamps the blade in a convenient position to facilitate its replacement.

3,780,671
ELASTOMERICALLY SPRING RAILWAY TRUCK BOLSTER

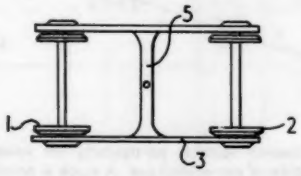
Reginald Harrison, Oadby, England, assignor to Dunlop Limited, London, England

Filed Jan. 31, 1972, Ser. No. 222,081

Claims priority, application Great Britain, Feb. 3, 1971, 3,765/71

Int. Cl. B61f *3/08, 5/08, 5/12*

U.S. Cl. 105—197 A **5 Claims**



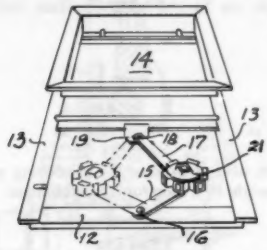
A three piece bogie for a railway vehicle in which the resilient connecting means between each solebar or side frame and the bolster comprises spring support means for vertical loads and at least two spaced-apart inter-engaging pairs of resilient members, one element of each pair mounted on the bolster and one on the solebar or side frame wherein the elements may only move relatively in a vertical direction and horizontal movement is resisted, of which the following is a specification.

3,780,672

HOPPER GATE TOGGLE OPERATING MECHANISM

Oliver C. Fuller, Woodstock, Ill., assignor to Evans Products Company, Plymouth, Mich.

Filed Mar. 28, 1972, Ser. No. 238,885
Int. Cl. B61d 7/02, 7/20, 7/26
U.S. Cl. 105—253 10 Claims



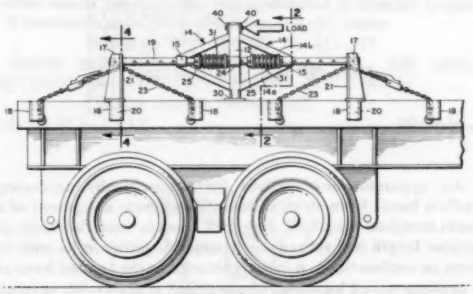
Mechansim for moving the gate of a material discharge chute which includes a toggle device actuated by applying a force at the joint between the toggle links. Such application may involve a manually operated lever readily applicable to and removable from the toggle device, but other means for exerting a thrust on the device are contemplated. Preferably the mechanism includes connections tending to lift the gate from its support on the chute.

3,780,673

RESILIENT SHOCK-ABSORBING BULKHEAD

William F. Doyle, 2818 McAlister St., Topeka, Kans., and Charles W. Artzer, 631 Freeman St., Topeka, Kans.

Filed Aug. 25, 1972, Ser. No. 283,761
Int. Cl. B60p 7/14
U.S. Cl. 105—376 11 Claims



A bulkhead for use on vehicles having an open flat cargo carrying surface and stake pockets comprises a retaining panel removably attached to the bed of the vehicle by means of sleeves secured to the panel and slidably mounted on a supporting rail secured to posts disposed in stake pockets. Springs mounted on the rail are compressed when a load is applied to the panel by shifting cargo and to absorb the shock of the impact.

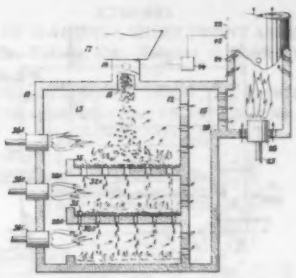
3,780,674

LIQUID INCINERATOR

Han Liu, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Feb. 11, 1972, Ser. No. 225,472
Int. Cl. F23g 5/12
U.S. Cl. 110—8 R 4 Claims

A waste incinerator for burning a variety of sludges, liquids and solid materials that can be reduced to a combustible liquid by exposure to heat. Such materials are fed into an incinerator and fall onto the uppermost of several superposed perforate beds. As the waste material is exposed to heat it becomes less viscous and slowly drips through the perforations of each bed to a subjacent bed where it is exposed to additional heat and ultimately gasified and burned.

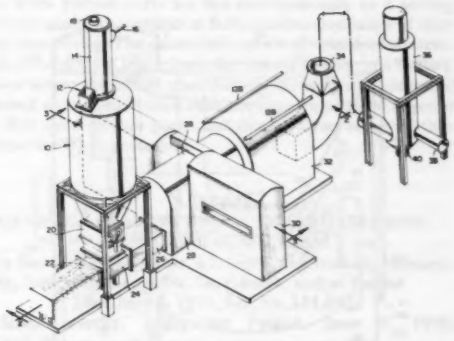


3,780,675

PLASMA ARC REFUSE DISINTEGRATOR

James A. Frye, Oklahoma City; Ralph B. Morton, Del City, and Charles W. Vogler, Oklahoma City, all of Okla., assignors to The Boardman Company, Oklahoma City, Okla.

Filed Apr. 18, 1972, Ser. No. 245,216
Int. Cl. F23g 5/10
U.S. Cl. 110—8 E 12 Claims



A refuse disintegrator utilizing a plasma arc for the reduction of solid waste materials to an ionized gaseous state through heat oxidation, leaving only sterilized residues and resulting in almost total elimination of all materials introduced into the system. The system in operation utilizes a thermal reduction theory designed to break down all classes of refuse through the application of extreme high temperature, releasing the internal energy of all matter and provides a highly efficient and economic system and process susceptible of automated control depending upon the nature of emission from the system.

3,780,676

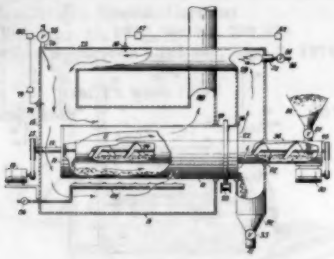
METALLIC RECOVERY SYSTEM

Noel D. Hazzard, and William M. Anderson, both of Wellsville, N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed May 8, 1972, Ser. No. 253,673
Int. Cl. F23g 5/06
U.S. Cl. 110—8 A 8 Claims

A conversion system for waste having organic and inorganic components wherein the organic components are pyrolyzed in an essentially oxygen-free atmosphere so as to preclude the

oxidation of the inorganic constituents. An afterburner provides the heat necessary for burning pyrolyzed gases and the carbonacious particulate matter produced in the pyrolyzing chamber. The pyrolyzing chamber is maintained at a suitable



temperature for properly pyrolyzing waste material by tempering hot gases exhausting from the afterburner with cool ambient atmosphere, and then directing the mixed gases back over the pyrolyzing chamber.

3,780,677

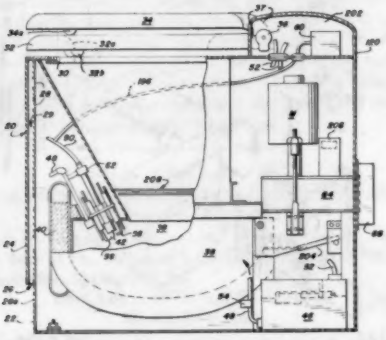
INCINERATOR AND IGNITION SYSTEM COMBINATION

Donald P. Frankel, Lake Geneva, Wis., assignor to La Mere Industries, Inc., Walworth, Wis.

Filed June 28, 1972, Ser. No. 267,043

Int. Cl. F23g *5/00*

U.S. Cl. 110—8 C **11 Claims**



An incinerating waste disposal plant, such as a dry sanitary toilet, including a fuel burner and an oscillator ignitition system for igniting the fuel. In the system disclosed, the oscillator is one in which the core of the inductive component is driven to saturation and provides intermittent high voltage across an igniter spark gap.

3,780,678

PROCESS AND APPARATUS FOR THE PRODUCTION OF TUFTED PILE FABRICS

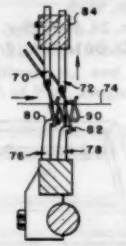
Joe T. Short, West Point, Ga., assignor to Doering Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 10, 1972, Ser. No. 216,630

Int. Cl. D05c *15/22*

U.S. Cl. 112—79 A **12 Claims**

Improved apparatus for producing tufted pile fabrics comprising a tufting machine having plural rows of needles and loopers wherein the loopers in a first row of loopers in the direction of travel of a backing sheet are longer than loopers of the next row so that yarn loops formed in the backing sheet by the first row of loopers are not displaced by the loopers in the next row to cause irregular formation of loops in the tufted



fabric product; also, a process for producing pile fabrics of uniform pile height by a loop robbing technique.

3,780,679

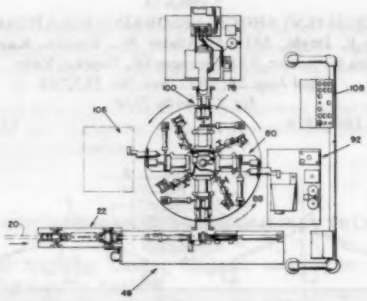
APPARATUS FOR PRODUCING ENDLESS BANDS

James Gordon Hanes, Jr., Pfafftown; James Frank King, 925 Goodwood Rd., Winston-Salem; Willie M. Lathery, 1342 Tredwell Dr., Winston-Salem; Howard L. Beamon, 2626 Dudley St., Winston-Salem, and Kenneth W. Newlen, 613 Runyon Dr., High Point, all of N.C.

Filed Sept. 29, 1971, Ser. No. 184,722

Int. Cl. D05b *23/00*

U.S. Cl. 112—121.27 **4 Claims**



An apparatus and method for automatically producing endless bands from strips of material wherein a segment of a predetermined length is detached from a material strip of greater length and subsequently joined together at its ends to form an endless band. A label is secured to the formed band at a predetermined location. The segment is preferably severed from the material strip, sewn together at its free ends, and provided with a desired label by a suitable apparatus adapted for barring and tacking operations. The various steps of construction are preferably completed at a plurality of work stations as a movable supporting surface moves the segment through a predetermined arrangement of said stations.

3,780,680

BELT-LOOP FEEDER, AND STRIP CUTTER

Jack E. Shuffield, Norwood, N.J., assignor to C & W Sewing Machine, New York, N.Y.

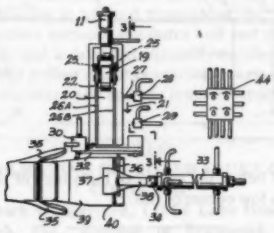
Filed Oct. 2, 1972, Ser. No. 294,223

Int. Cl. D05b *23/00*

U.S. Cl. 112—121.27 **7 Claims**

In a preferred embodiment, a belt loop strip receiving, advancing, cutting, and feeding apparatus automatic in operation at least per cycle upon manual initiation of a timer control, the functional parts thereof being pneumatically operated in the predetermined sequence of intermittent actuation of

respective parts, the feed strip typically being fed from a source such as a spool or reel, into a feed guide between opposingly pressed feed rollers for advancing intermittently the strip between and past open cutter opposing scissor blades onto a planar plate slide surface along a rearwardly disposed guide rail for aligning advancing strip axially laterally across the plate surface, the scissor blades being actuateable after advancement and alignment, the actuation-closing of the blade simultaneously causing a holder to press downwardly from above the plate surface securingly of the belt loop strip



severed from the feed strip, and thereafter the holder being pneumatically advanced forwardly to slideably push the belt loop strip into a sewing machine belt-loop receiver at a point angularly to the plate slide surface at which point holding pressure of the holder is insufficient to secure the belt loop severed strip, whereupon the advanced holder withdraws without the severed strip left forwardly at the sewing machine belt-loop receiver, after the return of which, or immediately before the return of which, the scissor blade opens, the opening of the scissor blade simultaneously causing the holder to lift from its holding down position.

3,780,681

SEWING MACHINE WITH A NEEDLE POSITIONING DEVICE

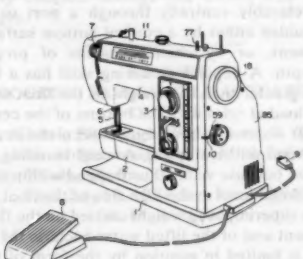
Toshio Sasaki, Inazawa-chi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Mizuho-ku, Nagoya-shi, Japan

Filed Dec. 27, 1971, Ser. No. 212,327

Claims priority, application Japan, Dec. 30, 1970, 45/125473; Dec. 31, 1970, 45/128236

Int. Cl. D05b *69/22*

U.S. Cl. 112—219 A **19 Claims**



A sewing machine so designed as to cause an arm shaft to be subject to different drive controls according to the operating position of a selection knob, though a controller may be continuously depressed in the same manner, wherein, under the first operating position of the knob, the depression of the controller effects continuous normal stitching and the release of the controller brings the arm shaft to rest at a predetermined angular position; under the second operating position of the knob, the depression of the controller causes the arm shaft to make one rotation and be brought to rest at a predetermined angular position regardless of the succession of the depression of the controller; and under the third operating position of the knob, the bobbin winder is actuated with the arm shaft kept inoperative at a predetermined angular position independently of the depression of the controller.

3,780,682

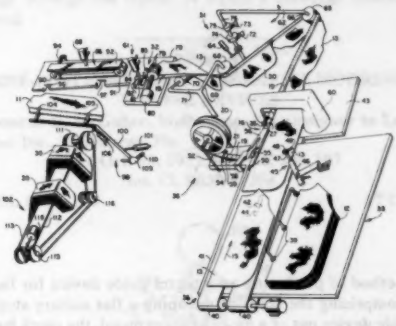
METHOD OF MAKING A SHIRT FRONT ASSEMBLY

Wade W. Frost, Vidalia, Ga., assignor to Oxford Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 79,031, Oct. 8, 1970, Pat. No. 3,675,604. This application Apr. 13, 1972, Ser. No. 243,753

Int. Cl. D05b *1/00, 23/00*

U.S. Cl. 112—262 **11 Claims**



A shirt front assembly, method and apparatus wherein a connected series of center plait pattern parts and a series of shirt front pattern parts are fed simultaneously to a sewing machine and sewn together to form a connected series of shirt front assemblies. The connected series of shirt front assemblies are conveyed away from the sewing station to a cutting station where the center plait pattern parts are cut apart and trimmed so as to have their ends coextensive with the edges of the shift front pattern parts, and the cut-apart series of shirt front assemblies are stacked.

3,780,683

GEAR FOR BRAKING AND AUXILIARY STEERING SHIPS ON BRAKING THEM

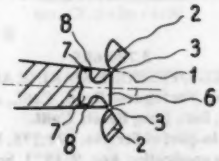
Jerzy Doerffer, 22 Lipca Str. 12, Sopot, and Walenty Milenuszkin, Andrezeja Struga Str. 6a, Gdansk, both of Poland

Filed June 8, 1971, Ser. No. 151,095

Claims priority, application Poland, June 9, 1970, 141212/70

Int. Cl. B63h *25/44*

U.S. Cl. 114—145 R **10 Claims**



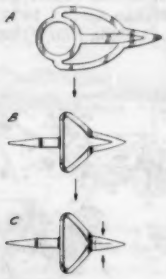
To exert a braking force with optional auxiliary steering on a ship, the bulbous portion of a bulbous bow of the ship is formed with at least one displaceable member which can be moved from a retracted position where it is smoothly contoured in the hull to an extended position where it extends into the water to exert braking force on the ship. A watertight bulkhead beyond the bulbous portion is formed with a water inlet leading to a passage with side channels having outlets at the side of the hull, and these outlets can be selectively covered or opened by independently operable gates.

3,780,684

METHOD OF MAKING INTEGRAL GUIDE FOR FISHING LINES

Ryuichi Ohmura, 19-3 Minami-cho, Shizuoka, Japan

Division of Ser. No. 96,952, Dec. 10, 1970, Pat. No. 3,690,027. This application Aug. 9, 1972, Ser. No. 279,248
Int. Cl. B21d *51/00*
U.S. Cl. 113—116 HH **1 Claim**



A method of producing an integral guide device for fishing lines comprising the steps of stamping a flat unitary stock of the guide device out of a piece of sheet metal, the stock having a ring, a pair of leg forming portions extending downwardly from the opposite peripheral sides of the ring and converging in a V-shaped lower end first foot forming portion and a second leg and foot forming portion extending downwardly from the lower periphery of said ring at a substantially midpoint between the first leg forming portions with the lower end thereof extending toward the V-shaped opening defined in the first foot forming portion and separated therefrom; bending the first leg and foot portions in a first direction away from the plane of the ring so as to form a pair of first legs which lie at a sloped angle to the ring plane and a common first leg which lies at right angles to the ring plane, respectively; and bending the second leg and foot forming portion in a second direction away from the ring plane opposite to the first direction so as to form a second leg which lies at a sloped angle to the ring plane and a second foot which lies at right angles to the ring plane, respectively.

ERRATUM

For Class 114—145 R see:
Patent No. 3,780,683

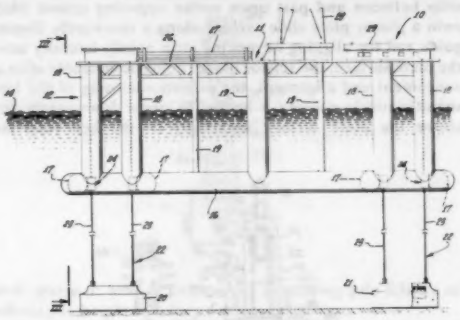
3,780,685

TENSION LEG OFFSHORE MARINE APPARATUS

Edward E. Horton, Portuguese Bend, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Continuation-in-part of Ser. No. 821,275, May 2, 1969, abandoned. This application Apr. 9, 1971, Ser. No. 132,791
Int. Cl. B63b *35/44*
U.S. Cl. 114—0.5 D **15 Claims**

An offshore mobile wave transparent marine apparatus constructed and arranged to be towed at a relatively rapid rate, stable and steady when anchored at a well site, and held by at least two virtually vertical mooring lines under selected tension. A marine apparatus having vertical buoyant columns related in size and location to horizontal buoyant members and designed for selected ocean and weather conditions, such as wave periods and height, whereby vertical forces acting on submerged substantially horizontal members and the vertical forces acting on the vertical members are offset and virtually canceled. Tensioned mooring means are held by restraint means located below the center of buoyancy of the apparatus for providing a low center of roll.

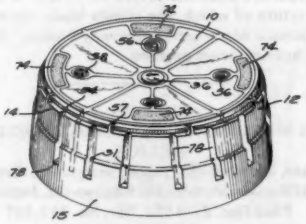


3,780,686

FLOAT

Edward F. Brill, Oconomowoc, Wis., assignor to Beach-Buoy, Inc., Oconomowoc, Wis.

Filed Sept. 24, 1971, Ser. No. 183,316
Int. Cl. B63b *35/58*
U.S. Cl. 114—0.5 F **19 Claims**



A float comprising a deck component has an upper deck wall and, in one embodiment, generally conical supports for said wall, the space about said supports being filled or partially filled either with air or buoyant material. Air is vented to atmosphere, preferably centrally through a port or ports to which air is guided either by a conical bottom surface of the deck component, or by channel means of progressively decreasing depth. A depending flaring skirt has a buoyancy preferably no greater than the weight of the float so that the float when unloaded rides with the bottom of the central vent substantially at water level. Water between the central vent and the peripheral skirt is trapped. A weight tending to tilt the float is opposed because water thus trapped within the skirt is lifted above normal level at the high side of the float. The moment arm of a superimposed weight carried on the float is less than the moment arm of the lifted water because the superimposed weight is limited in position by the form of the deck. The difference in dimension between the skirt and the deck component not only provides increased stability but facilitates nesting.

3,780,687

SHIP HULL CONSTRUCTION

James C. McDonald, Jr., 2033 Charles, Vidalia, La.

Filed Dec. 17, 1971, Ser. No. 209,297
Int. Cl. B63b *35/08*
U.S. Cl. 114—41 **8 Claims**

A cargo ship hull designed primarily for the transport of liquids and yet also adaptable for transporting solids. The hull is cylindrical in configuration and includes conical bow and

stern ends with the major portion of the length of the hull disposed between the bow and stern ends including an inner generally cylindrical cargo compartment downwardly offset relative to the centerline of the outer cylindrical skin of the hull and divided into longitudinally spaced compartment sec-

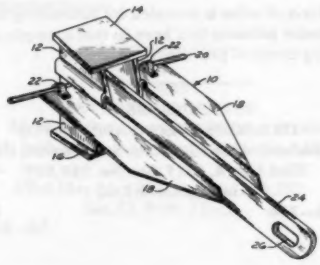
tions. Truss bracing is utilized throughout the length of the main cargo section between the outer hull and the inner compartment walls and a board structurally reinforced concrete bottom keel and ballast member extends longitudinally of the hull between the outer hull and the inner compartment wall.

3,780,688

ANCHOR HAVING IMPROVED FLUKE CROWN COUPLING

Daniel Comstock Hungerford, 11651 Lake House Ct., North Palm Beach, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 7, 1971, Ser. No. 178,233
Int. Cl. B63b *21/44*
U.S. Cl. 114—208 **4 Claims**



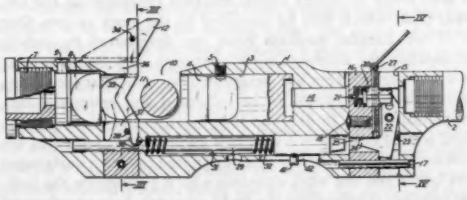
An anchor for marine vessels having an improved fluke which is removeably coupled to the crown assembly by a longitudinal flange disposed along the fluke inside edge. The removeable flukes allow the shank pivot shaft to be removeably coupled through the crown wall adjacent the fluke flanges.

3,780,689

SELF-COCKING EXPLOSIVELY ACTUATED CABLE CUTTER

Joseph L. Giebel, Pittsburgh, and Ernest E. Temple, Murrysville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed July 19, 1971, Ser. No. 163,949
Int. Cl. B63g *7/02*
U.S. Cl. 114—221 A **1 Claim**



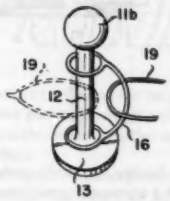
A cable cutter frame has a laterally opening recess near its front end for receiving a cable that can be cut by a chisel slidably mounted in the frame behind the recess when it is driven forward by an explosive charge. A plunger for actuating a firing pin is carried by the frame beside the recess and chisel and is slidable lengthwise of the frame. The plunger is provided adjacent the recess with a lateral notch that receives one end of a trigger extending transversely of the frame near the front of the recess in a position to be moved forward by a cable entering the recess, whereby to move the plunger forward against spring pressure. As the trigger is moved forward it withdraws from the notch, whereupon the plunger is driven rearwardly to actuate the firing pin. The anvil may be slidably mounted in the frame and provided with a shock absorber. The firing pin is preferably in the inner end of a transverse passage through the frame, in which a cartridge chamber is screwed.

3,780,690

LINE-POST COUPLINGS AND MARINE MOORING-TOWING DEVICES

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop A Line, Inc., Melbourne, Fla.

Filed Oct. 10, 1972, Ser. No. 296,107
Int. Cl. B63b *21/04*
U.S. Cl. 114—218 **17 Claims**



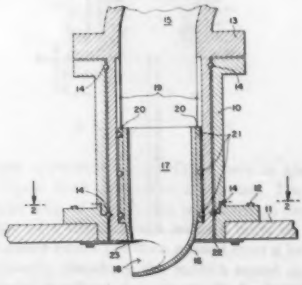
Line-post couplings with marine mooring-towing and other applications having a post with an enlarged head and with mounting members including a fixed or movable clevis member whereby a line with a loop may be quickly attached and detached without the necessity of tieing and untieing knots. The enlarged head may be integral with the post or detachable. The clevis may include a pair of rings and be movable on the post or one ring may be omitted and the lower clevis end affixed to the post or post base. A line anti-fraying member may also be affixed to the clevis. A device may be mounted on a tow truck, dock, or a boat, and with slight modification the device may be mounted on dock pilings and bollards or lock walls with or without a float member.

3,780,691

RETRACTABLE WATER JET FOR A WATER JET/STEERING AND PROPULSION SYSTEM

William Stelling, 175 W. 72nd St., New York, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,294
Int. Cl. B63h *11/00*
U.S. Cl. 115—12 R **6 Claims**



A vertically moveable water jet thruster unit for a water jet propulsion and steering system of a water vessel. The water jet

unit comprises a stationary support cylinder rigidly affixed to the hull of the water vessel, a rotatable support cylinder mounted in the stationary cylinder on roller bearings, and a vertically moveable water jet disposed in the rotatable support cylinder in guide tracks. Vertically disposed guide members affixed to the water jet are disposed in the tracks in the rotatable cylinder and guide the water jet vertically upwardly into the water vessel when an underwater collision occurs.

3,780,692

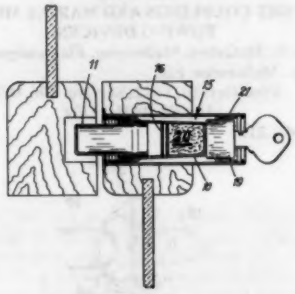
ALARM DEVICE

Phillip L. Nally, 205 W. Stephen Foster Ave., Bardstown, Ky.

Filed June 20, 1972, Ser. No. 264,415

Int. Cl. G08b *7/00*

U.S. Cl. 116—5 **7 Claims**



An alarm device having an open-ended compressed gas container means with a connection member adjacent the open end thereof; a whistle which extends across the container means adjacent to its open end, the whistle being actuated by a gas passing therethrough; and a destructable cap member which has a connection member sized to engage the connection member of the open-ended container means to interlock therewith to form a capsule for compressed gas, the cap being of suitable material such that when it is destroyed or removed the gas escapes through the whistle thus sounding the alarm.

3,780,693

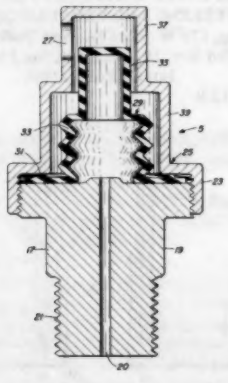
VISIBLE FLUID PRESSURE INDICATOR

Edward L. Parr, 301 N. Cuyamaca, El Cajon, Calif.

Filed May 15, 1972, Ser. No. 253,545

Int. Cl. G01l *19/12*

U.S. Cl. 116—70 **4 Claims**



An indicator including a casing having a coupling connected with a source of fluid and a cap for the coupling, the cap having a window. The indicator also includes a closed, expansible and contractible container that is disposed within the cap, part of the container being visible through the window.

3,780,694

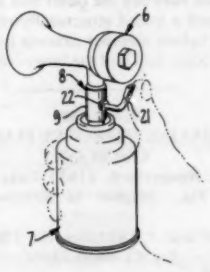
VALVE STRUCTURE FOR GAS OPERATED HORN

Robert L. Wilbur, North Windham, Maine, assignor to The Eastern Company, Naugatuck, Conn.

Filed May 5, 1972, Ser. No. 250,600

Int. Cl. G08b *21/00*

U.S. Cl. 116—112 **1 Claim**



A novel form of valve is provided for controlling the release of the gas under pressure to a horn so that a simple and effective signalling device is provided.

3,780,695

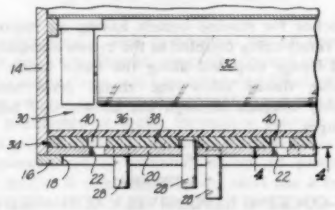
WORK SCHEDULING APPARATUS

Willard H. Richard, 42865 Jefferson St., Fremont, Calif.

Filed Aug. 4, 1971, Ser. No. 168,889

Int. Cl. G08b *5/00*

U.S. Cl. 116—136 **17 Claims**



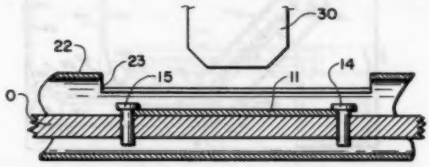
Work scheduling apparatus for scheduling and monitoring the status of a number of tasks specified by work orders and performed by operators which may be persons or machines. The apparatus includes a work scheduling board having timing means for indicating elapsed time and an array of work scheduling positions arranged in horizontal and vertical rows for selectively receiving coded markers representing the different tasks which may be specified by the work orders. One set of the parallel position rows are designated by indicia representing the different work operators, and the remaining rows and the markers are designated by indicia representing the several work orders to be executed and estimated task completion times. In use, the task markers are placed in the board positions in such a way that each marker indicates the estimated completion time of a designated task of a designated work order and the work operator who is to perform the task. The markers representing the tasks currently being performed by the operators are illuminated in a unique way so that the work scheduler may quickly determine by observation of the board the current status of each operator and task.

3,780,696

SUBSTRATE HOLDER FOR ARC PLASMA DEPOSITION

Richard W. Babbitt, Fair Haven, and Joseph LoCicero, Middletown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1972, Ser. No. 270,747
Int. Cl. C23c *13/08*
U.S. Cl. 118—49.5 3 Claims



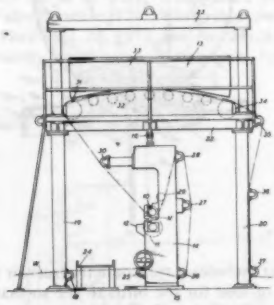
A tubular container, of refractory material has an opening in a top portion thereof. A horizontally disposed, thermally stable, perforated plate is supported by vertical portions of said container. A substrate, in alignment with said opening, is supported on said plate and clamped thereon by flanged pins combined with the perforations. An arc plasma gun deposits on the clamped substrate.

3,780,697

REVERSIBLE COATER

James J. Melead, Roscoe, and William P. Wentworth, Rockford, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed May 11, 1972, Ser. No. 252,277
Int. Cl. B05c *11/12*
U.S. Cl. 118—65 13 Claims



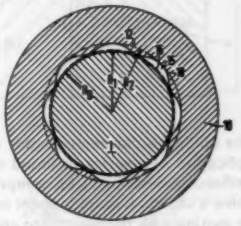
A coating mechanism for applying a coating to a traveling web wherein the web is received from a feed direction and the machine is to be used for coating either the upper or lower side of the web. The machine includes a pair of coating rolls forming a horizontal coating nip with the lower roll applying coating to the web, guide rolls for turning and guiding the web from the feed direction to the coating nip, an overhead dryer receiving the web from the nip, a frame supporting the guide rolls and coating rolls and pivotal about a vertical axis 180° between a first position wherein the web is wrapped in one direction around a lower guide roll to coat one surface of the web and a second position wherein the web is wrapped in the other direction around the lower guide roll to coat the opposite surface of the web.

3,780,698

WIRE PLATING APPARATUS INCLUDING DOCTORING DIE

Horst Schreiner, and Henryk Fidos, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Continuation-in-part of Ser. No. 88,285, Nov. 10, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,852
Claims priority, application Germany, Nov. 13, 1969, P 19 57 033.4
Int. Cl. B05c *11/02*
U.S. Cl. 118—125 6 Claims



The invention relates to a device for tin plating copper jump wires. The copper wire passes through a tin bath and is guided through a stripper nozzle, whose outlet opening is below the plane of the bath surface.

The bore of the stripper nozzle possesses a wave shaped cross section. For a wire diameter of 0.5 mm, 4 to 20 half waves are provided and the diameter of the bore and the depth of the half waves are adjusted to the diameter of the wire.

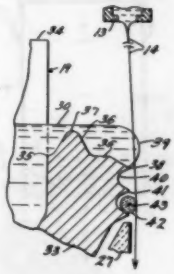
The tin plated copper wires have a uniform tin layer with a thickness $> 3\ \mu m$ and are extremely well solderable.

3,780,699

FILAMENT COATING APPARATUS

Roger A. Kime, 101 De Rome Dr., Napoleon, Ohio

Division of Ser. No. 244,182, April 14, 1972. This application Nov. 6, 1972, Ser. No. 303,902
Int. Cl. B05c *3/176*
U.S. Cl. 118—420 5 Claims



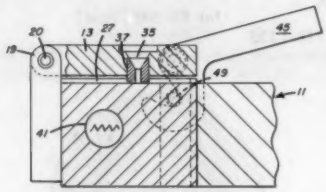
Method and apparatus for coating fibers of glass and the like with a liquid such as molten aluminum. The fibers are passed through a lip of the molten metal which projects from an upper edge of a vessel which holds a body of the molten metal. The coated fibers are then passed over a heated wiper to more uniformly distribute the molten metal on the fibers before the metal hardens. An automatic control is provided for maintaining a substantially constant molten metal level in the vessel as the metal is applied to the fibers.

3,780,700

TEMPLATE FOR THIN LAYER CHROMATOGRAPHY SAMPLES

Bob A. LaFleur, and Robert J. O'Brien, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1971, Ser. No. 189,112
Int. Cl. B05c *11/12*
U.S. Cl. 118—503 9 Claims



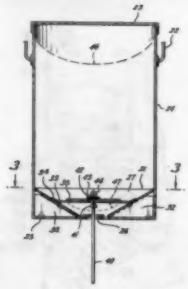
A template for holding a chromatographic sheet while permitting the application of a series of liquid samples rapidly, and on a well defined area of fixed size, comprises a base plate adapted to receive a chromatographic sheet on its surface, an applicator plate mating with the base plate and adapted to lie on top of the sheet, and means for clamping the parts together to hold the sheet in place. The applicator plate and the base plate are hinged together and provided with latches for clamping them together. To provide wells for receiving liquid samples, the applicator plate has a plurality of bores therethrough within which are pressed plastic bushings for engaging the chromatographic sheet without damaging its delicate surface. Also, two stop springs ease the movement of the applicator plate into register with the base plate so as to avoid damage to the chromatographic sheet. The base plate is provided with an abutment against which an edge of a chromatographic sheet is precisely positioned. The hinges are readily disengaged and reengaged to permit cleaning of the parts. Evaporation of solvent from the samples can be assisted by providing a suitable electrical heater in the base plate.

3,780,701

WILDLIFE FEEDER

William M. Wentworth, Sr., 619 Clower, San Antonio, Tex.

Filed Feb. 23, 1973, Ser. No. 335,100
Int. Cl. A01k *5/00*
U.S. Cl. 119—51 R 11 Claims



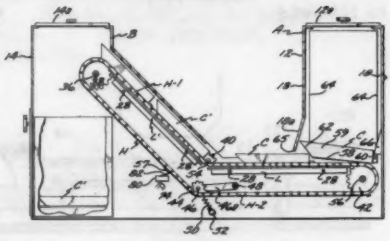
A wildlife feeder which includes a container with a bore in the bottom thereof, means in said container for directing the flow of feed toward a selected portion of said bottom, an annular member slidably mounted on said selected portion, and a rod pivotally mounted in said container, a portion of said rod adapted to pass through said annular member and said bore and terminate substantially below said container whereby feed carried in said container is dispensed through said annular member and said bore upon movement of said rod.

3,780,702

POWER OPERATED ANIMAL FEEDING AND WATERING DEVICE

Richard N. Waterbury, 4582 Banner Dr., Long Beach, Calif.

Filed Nov. 6, 1972, Ser. No. 303,679
Int. Cl. A01k *5/02*
U.S. Cl. 119—51.13 8 Claims



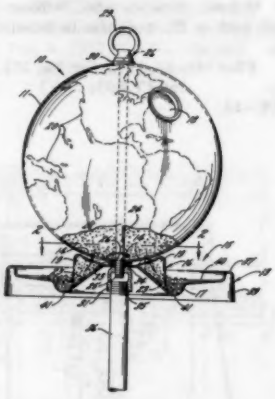
Power-operated device for periodically supplying an animal with a predetermined quantity of food, as well as maintaining a receptacle with water at a predetermined level, and from which receptacle the animal may quench its thirst.

3,780,703

BIRD FEEDER

Robert R. Boehland, Jr., Lynn, Wis., assignor to Feather Hill Industries, Inc., Zenda, Wis.

Filed June 23, 1972, Ser. No. 265,470
Int. Cl. A01k *5/00*
U.S. Cl. 119—53 10 Claims



A bird feeder includes a transparent reservoir for storing a large quantity of feed for the birds to see so that more birds are attracted to the feeder. Orifices communicating with the reservoir are adjustable between open and closed positions to regulate the gravity flow of feed onto a tray located below the reservoir in order to maintain a limited but adequate amount of feed for the birds to eat.

3,780,704

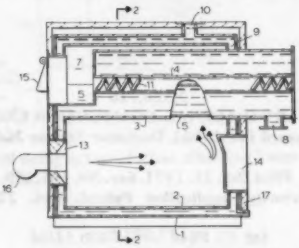
BOILER

H. Cevdet Ozaltay, Kucukesat Caddesi, 55/13, Ankara, Turkey

Filed Jan. 15, 1973, Ser. No. 323,862
Claims priority, application Turkey, Jan. 19, 1972, 003222
Int. Cl. F22b *25/00*
U.S. Cl. 122—149 5 Claims

A boiler has two main concentric cylinders defining a water jacket between them. A smaller cylinder, located inside the

inner of the two concentric cylinders in the upper half thereof, contains a plurality of tubes each having turbulator means. Two more water-filled cylinders, still smaller in diameter, are connected to the water jacket and are arranged on both sides of the smaller cylinder in the upper half of the inner cylinder, in contact therewith and spaced from said inner cylinder by narrow passages. The combustion chamber is in the inner main cylinder, below said smaller cylinder and water-filled cylinders and bounded partly thereby. A convection chamber in the inner main cylinder is connected to said combustion chamber by the narrow passages. The tubes have an entrance



end spaced back from the front closure of the main cylinders, so that the combustion gases from the combustion chamber first pass into the convection chamber and flow toward the front closure and then enter and flow through the tubes, heating the water in the water jacket and in the water-filled cylinders. As a result, the flue gases produced by the combustion, return without any considerable pressure loss and at the same time decrease their temperature by transferring their enthalpy through convection, and the smaller cylinder and water-filled cylinders protect the flue gases produced by the combustion from the radiation effect of the combustion flame.

3,780,705

METHOD OF CONTROLLING THE FEED OF FORCED CIRCULATION STEAM GENERATORS

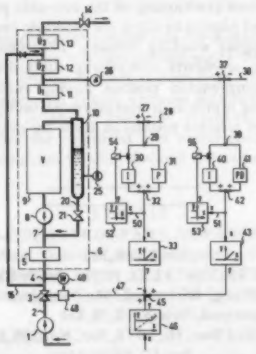
Dominique Le Febve de Vivy, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sept. 25, 1972, Ser. No. 291,934

Claims priority, application Switzerland, Sept. 24, 1971, 13968/71

Int. Cl. F22d *5/26*

U.S. Cl. 122—451 R **8 Claims**



The rate of feedwater flow is controlled in a first load range by the level of water in the separator while in a higher load range the rate is controlled by the steam temperature. Signals are produced which are compared with preset values and are integrated so as to produce a negative control signal in one case and a positive control signal in the other case. Only one of these control signals is superimposed on a base signal only when the generator is in a respective load range so as to produce a command signal for adjusting the feed controller of the feed valve.

3,780,706

OBTURATING DEVICE FOR THE INTAKE PIPE OF AN INTERNAL COMBUSTION ENGINE, ESPECIALLY FOR A ROTARY PISTON ENGINE

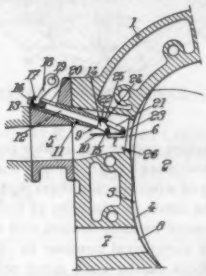
Jean Panhard, Paris, France, assignor to Societe De Constructions Mecaniques Panhard & Levassor

Filed July 9, 1971, Ser. No. 161,063

Claims priority, application France, July 10, 1970, 7025860

Int. Cl. F02b *53/06*

U.S. Cl. 123—8.01 **1 Claim**



The device includes a valve adapted to be closed, when the intake of fuel is reduced, to prevent the entry of burnt gases into the intake pipe. The valve is actuated by a mechanism arranged so that the valve can be fully opened and can shut the intake pipe at a short distance from the peripheral surface of the combustion chamber of the engine. The device is especially useful for rotary piston engines with peripheral ports.

3,780,707

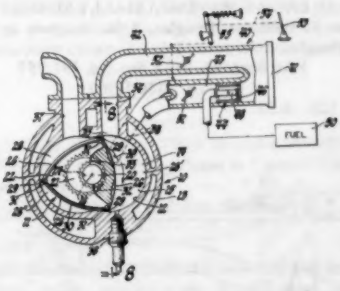
STRATIFIED CHARGE ROTARY COMBUSTION ENGINE

Edward N. Cole, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 1, 1972, Ser. No. 248,864

Int. Cl. F02b *53/04*

U.S. Cl. 123—8.13 **8 Claims**



A rotary combustion engine having an intake arrangement providing a controlled peripheral variation in the air-fuel mixture in each working chamber to effect a trailing rich air-fuel region for ignition and a leading lean air-fuel region for continuing combustion.

3,780,708

ROTARY COMBUSTION ENGINE

Robert J. Angsten, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1972, Ser. No. 289,479
Int. Cl. F02b 53/04
U.S. Cl. 123—8.17 4 Claims

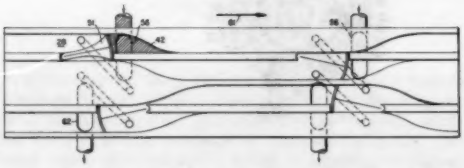
A rotary combustion engine has a rotor concentric with and rotatable about a stator with the rotor and stator cooperatively defining a plurality of working chambers that are spaced about and rotate with the rotor. A plurality of baffles are mounted on the stator and move radially inward and outward to follow the rotor's interior peripheral contour to sequentially divide each of the chambers during each rotor revolution into two sealed portions. As the chambers rotate, one of the baffles operates to provide one of the working chambers with a sealed chamber portion which expands during an intake phase while connected to an intake port in the stator and thereafter another baffle operates to provide this one working chamber with a sealed portion containing the intake mixture which is compressed during a compression phase and delivered by porting in this baffle to a storage charge chamber in the stator. Another baffle then separates this one working chamber into a sealed portion to which the compressed mixture is delivered from the storage chamber via porting in this baffle with the compressed mixture then being ignited by a spark plug on the stator. Another baffle then divides this one working chamber into a sealed portion from which the products of combustion are exhausted to an exhaust port in the stator while the other sealed portion of this one chamber undergoes a similar cycle on the same rotor revolution via similar intake porting, baffles, storage charge chamber, spark plug and exhaust porting.

3,780,709

ROTARY ENGINE HAVING AXIALLY SLIDING VANES

Benjamin F. Williams, Douglas, Ariz., assignor to Benwilco, Inc., Douglas, Ariz.

Filed Sept. 25, 1972, Ser. No. 291,757
Int. Cl. F02b 53/00
U.S. Cl. 123—8.23 11 Claims



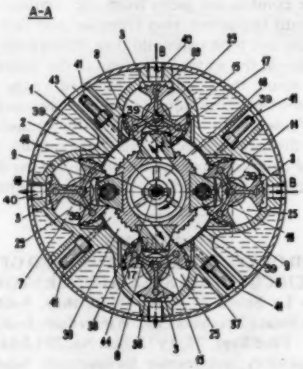
An internal combustion engine has a stator with an interior cylindrical surface symmetrical about an axis. A rotor within the stator is rotatable about the axis and has a pair of axially sinuous, peripheral channels open to the cylindrical surface. Annular flat plates in the stator extend radially into the channels dividing them into pockets. Axial movable vanes are disposed in the channels and in gaps in the plates. A combustible inlet port opens into one channel and an exhaust gas outlet port opens into the other channel. A combustion chamber having an ignition device has ducts leading to one stator opening adapted as the rotor revolves alternately to open into one channel and to be covered by the rotor and leading to another stator opening adapted as the rotor revolves alternately to open into the other channel and to be covered by the rotor.

3,780,710

ROTARY INTERNAL-COMBUSTION ENGINE

Zdislaw Ryszard Przybylski, Dachauer Strasse 266/I, Munich, Germany

Filed Oct. 21, 1971, Ser. No. 191,259
Claims priority, application Poland, Oct. 22, 1970, P-144010
Int. Cl. F01c 1/14; F02b 53/04
U.S. Cl. 123—8.47 26 Claims



A rotary internal combustion piston engine providing for relative operative positioning of the movable portions, such as rotary cogs and pistons to allow for multiple and varied utilization of the engine working volume. The pistons are divided into operative segments comprising suction-exhaust pistons and power-compression pistons having reduced clearance power loses and minimal or maximum pressure differentials as required by the relative pistons to allow for maximum efficiency.

3,780,711

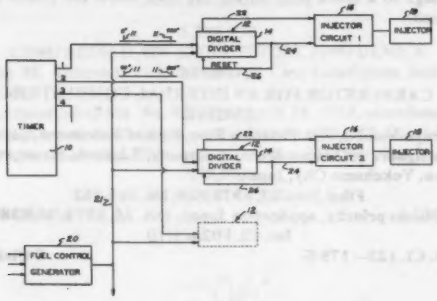
ELECTRONIC FUEL INJECTION SYSTEM

Allen W. Lindberg, Kirkwood, Mo., assignor to ACF, Industries, Incorporated, New York, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,633
Int. Cl. F02b 3/00
U.S. Cl. 123—32 EA 11 Claims

A sequential fuel injection system for an internal combustion engine has a separate electrical channel for each injector, each channel including a binary electronic counter. All said counters receive pulses from a voltage controlled generator whose frequency is set by the fuel demand. Engine

operated timing means cause the counters to operate sequentially. An injector may be put into operation while a preceding injector is still being actuated, thus affording longer periods of injector operation.



3,780,712

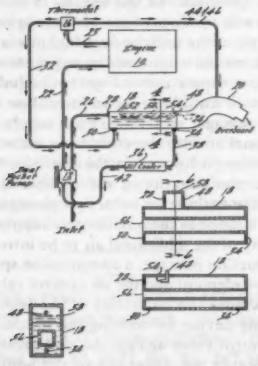
MARINE ENGINE COOLING

John G. Pace, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 127,489, March 24, 1971, Pat. No. 3,734,170. This application Nov. 13, 1972, Ser. No. 306,247

Int. Cl. F28f *27/02*; **F01n** *3/04*; **F01p** *3/12*

U.S. Cl. 123—41.08 **3 Claims**



Improved water jacketed manifolds for marine engine cooling systems of the type wherein heated water which has circulated through an engine cooling system for cooling purpose is mixed in the improved engine exhaust manifold water jacket according to this invention with raw, relatively cool water to controllably cool the manifold and avoid condensing water from the exhaust gases flowing through the exhaust manifold.

3,780,713

VACUUM-OPERATED SPARK ADVANCE DEVICE

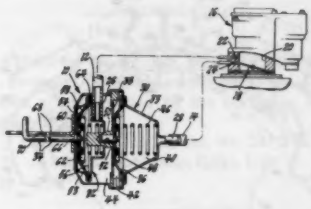
Clarence L. Julian, Daleville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 5, 1972, Ser. No. 286,308

Int. Cl. F02p *5/10*

U.S. Cl. 123—117 A **2 Claims**

A spark advance device for an automobile ignition system having a pair of axially spaced vacuum operated actuators each of which houses a spring-biased diaphragm dividing the housing into a vacuum chamber and an atmospheric pressure chamber. The diaphragms of both actuators are adapted to move in the same direction when vacuum is applied to either actuator and the diaphragm of one actuator is connected to the housing of the other actuator while the diaphragm of the latter mentioned actuator has a control rod connected to the distributor of the ignition system. The arrangement is such that when vacuum is sequentially applied to the actuators, the control rod initially moves a predetermined distance to advance the spark and subsequently moves a further distance in the same direction to further advance the spark.



3,780,714

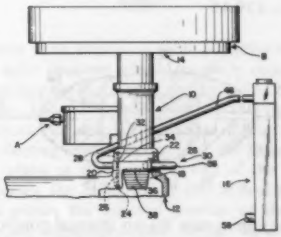
FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINES

Dorris Leon Dillow, 541 E. Haven Dr., Centralia, Ill.

Filed Aug. 2, 1971, Ser. No. 168,076

Int. Cl. F02m *31/10*

U.S. Cl. 123—122 AA **1 Claim**



A tubing is tightly coiled in a frusto-conical shape and is vertically installed within the intake manifold chamber of an internal combustion engine below and in common mounting arrangement with a conventional carburetor for prehcating and vaporizing the liquid fuel emitted from the throat of the carburetor. The coiled tubing has opposing open ends that are connected to the water cooling system of the engine and function as inlet and outlet ends for the thermostatically controlled passage of hot water through the coils of the tubing so that when the liquid fuel, passing through the vertical path defined by the turns of the tubing, comes in contact with the tubing it is instantaneously changed within the manifold chamber into a vapor.

3,780,715

EARLY FUEL EVAPORATION INTAKE MANIFOLD

John L. Flitz, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

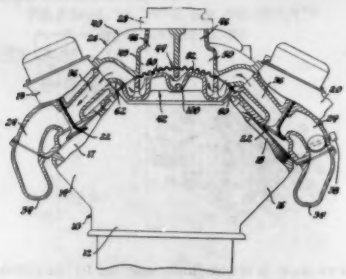
Filed Nov. 30, 1972, Ser. No. 310,813

Int. Cl. F02m *31/08*, *31/12*

U.S. Cl. 123—122 AB **3 Claims**

An early fuel evaporation intake manifold for an internal combustion engine includes a low thermal mass, thin metal gasket plate clamped between upper and lower manifold castings and having an integral heat exchanger forming the floor of the riser bore plenum. The gasket plate and a cored channel in the lower manifold casting define an exhaust crossover passage having a vertical run incident to the heat exchanger and flaring to a restrictive high aspect-ratio heat

transfer duct coextensive with the heat exchanger. The exhaust gases are directed against the heat exchanger at the vertical run and accelerate through the restrictive duct to break



up the stagnant fluid film at the heat exchanger for effecting rapid heating thereof to promote greater fuel vaporization during engine warmup.

3,780,716

FUEL INJECTION SYSTEMS

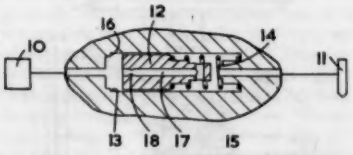
Ivor Fenne, Greenford, England, assignor to C.A.V. Limited, Birmingham, England

Filed Feb. 16, 1972, Ser. No. 226,793

Claims priority, application Great Britain, Feb. 18, 1971, 5,032/71

Int. Cl. F02m *39/00, 49/07*

U.S. Cl. 123—139 AS **5 Claims**



A fuel injection system for an internal combustion engine includes an accumulator in which fuel is stored at high pressure and an injector through which fuel flows to the combustion space of an associated engine. The injector incorporates valve means to control the quantity of fuel supplied to the engine and interposed between the injector and the accumulator is a piston slidable within a cylinder, the piston being urged in one direction by the flow of fuel and in the event that the valve means fails and remains in the open position, the piston moves a further amount into contact with a seating to prevent further flow of fuel through the nozzle.

3,780,717

AC IGNITION SYSTEM

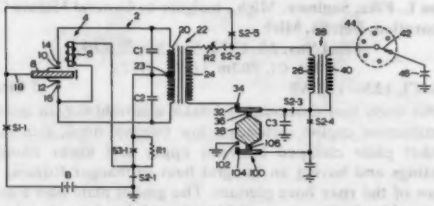
Miodrag Rakitch, 4 Honey Dr., Scarborough, Ontario, Canada

Filed Jan. 13, 1972, Ser. No. 217,601

Claims priority, application Canada, Mar. 26, 1971, 108785

Int. Cl. F02p *3/02, 3/04*

U.S. Cl. 123—148 AC **1 Claim**



An AC ignition system for automobiles, in which a vibrator operating at between 60 and 120 cycles per second supplies AC current through a transformer and through a set of normally open points to the primary of an ignition coil. When the points close, the coil is energized with AC and delivers high voltage to a spark plug during the time when the points are closed.

3,780,718

CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE

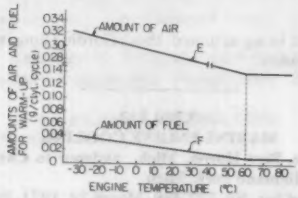
Shyuya Nambu, and Yukihiro Etoo, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama City, Japan

Filed June 22, 1972, Ser. No. 265,352

Claims priority, application Japan, Oct. 25, 1971, 46/83896

Int. Cl. F02m *1/10*

U.S. Cl. 123—179 G **9 Claims**



A carburetor for an internal combustion engine having an auxiliary mixture supply control system which is adapted to supply the engine an enriched air-fuel mixture during starting and warm-up operations of the engine to effect satisfactory starting and warm-up operations of the engine, the quantity and air-fuel ratio of the enriched air-fuel mixture being varied in dependence on the variations in engine temperature. The auxiliary mixture supply control system includes an auxiliary fuel supply circuit for admitting additional air into a carburetor induction passage, an auxiliary air supply circuit for admitting additional air into the carburetor induction passage, a needle valve element located in the auxiliary fuel supply circuit to control the quantity of the additional fuel to be introduced into the carburetor induction passage, an air control valve element located in the auxiliary air supply circuit to control the quantity of the additional air to be introduced into the carburetor induction passage, a compression spring for biasing the needle valve element and the air control valve element to a position to decrease the quantities of the additional fuel and air, an actuating device for moving the needle valve element and the air control valve against the compression spring to a position to increase the quantities of the additional fuel and air, and an electronic control circuit responsive to the engine temperatures for varying the magnitude of electric current to be supplied to the actuating device in dependence on the variations in the engine temperature.

3,780,719

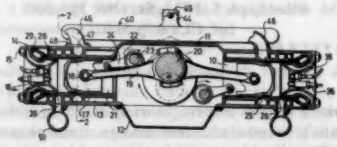
INTERNAL COMBUSTION ENGINE

Axel Hugo Weiertz, Bellevuevagen 24, Malmo, Sweden

Filed July 30, 1971, Ser. No. 167,708

Int. Cl. F01l *5/06*

U.S. Cl. 123—188 C **2 Claims**



An internal combustion engine having a cylinder and a piston reciprocable therein is provided with an inlet manifold

having an air intake and a connection to the inlet of the cylinder, which forms a closed circulation path for air drawn into the inlet manifold when the engine is operating.

3,780,720

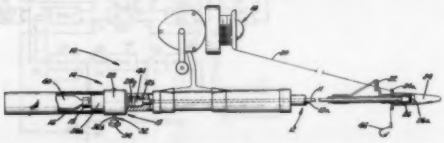
COMPRESSED AIR SPEAR PROJECTING DEVICE

John M. Alderson, 21332 Bulkhead Cir., Huntington Beach, Calif.

Continuation of Ser. No. 826,764, April 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 586,747, Oct. 14, 1966, abandoned. This application Mar. 31, 1971, Ser. No. 130,008

Int. Cl. F41b *11/00*

U.S. Cl. 124—11 A 1 Claim



A valve, connectable to a source of compressed gas, having a closing member movable into and out of a valve closing position, and a triggering mechanism by which the closing member can be moved from that position. Gas pressure in the valve holds the closing member in its valve closing position until the triggering mechanism is actuated. The triggering mechanism includes a cam segment and a cam follower pin, the pin being positioned to unseat the closing member when induced to do so by movement of the cam segment. The valve can be used to control the flow of propulsion gas through a spear-fishing gun. A spear is mounted on a rod through which compressed air is forced. The compressed air is forced out through openings in the side of the rod so as to act on a flexible sleeve which in turn acts against the open end of the spear mounted on the sleeve. The pressure on the open end of the spear holds the spear in place while sufficient pressure for projecting the spear is being built-up in the hollow portion of the spear. The closed end portion of the hollow area of the spear is adjacent the open end of the rod from which the compressed air flows.

3,780,721

CIRCULATING-AIR OVEN WITH FILTER

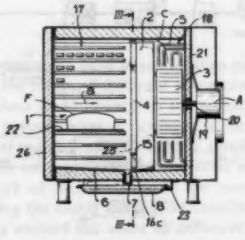
Wilfried Durth, Burbach-Wahlbach, Germany, assignor to Burger Eisenwerke A.G., Herborn/Dillkreis, Germany

Filed Apr. 24, 1972, Ser. No. 247,160

Claims priority, application Germany, Apr. 30, 1971, P 21 21 367.2

Int. Cl. F24c *15/32*

U.S. Cl. 126—21 A 7 Claims



A fan is provided in an oven chamber and draws air axially in through a hood and expels it radially outwardly over a heating element to heat a foodstuff. A filter is provided across the mouth of the hood. The bottom of the chamber is dished upwardly concave and is provided at its lowest point with an outlet opening into a receptacle pan which catches condensate dripping from the filter. This filter is a stack of screens held in place in a frame by a retaining element having laterally projecting pins which engage slots in the frame bayonet-fashion and which are received in holders provided in the frame.

3,780,722

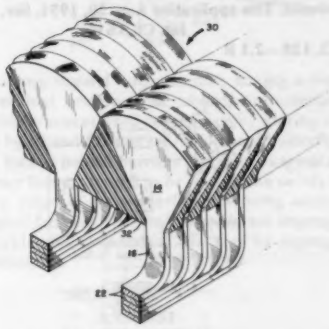
FIBER OPTICAL SOLAR COLLECTOR

Charles J. Swet, Mt. Airy, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1972, Ser. No. 247,774

Int. Cl. F24j *3/02*; G02b *5/16*

U.S. Cl. 126—270 6 Claims



The invention is an improved solar collector comprising a fiber optical solar receiver which passively concentrates incident solar energy for delivery as an intensified flux to an absorptive target. In one embodiment of the invention, the present solar collector comprises a boule of fibers shaped into an arcuate collecting surface at one end, the fibers tapering to a flat output plane at the opposing end of the boule. Solar radiation entering the collector at the collecting surface is concentrated within the tapered portion of the boule and delivered as an intensified flux to an absorptive target disposed in operative relation to the output plane, the absorptive target being either a cookpot, a thermal storage mass, or the hot junction of a thermoelectric generator.

3,780,723

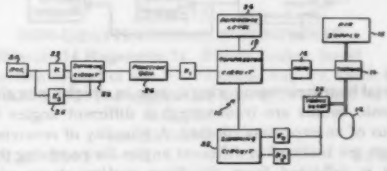
PRESSURE CONTROL SYSTEM FOR G-SUIT

Robert E. Van Patten, Kettering, Ohio, and Dana B. Rogers, Duxbury, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 18, 1972, Ser. No. 273,005

Int. Cl. A61f *5/37*

U.S. Cl. 128—1 A 2 Claims



A control system for a G-suit having an acceleration signal and a time rate of change of the acceleration signal supplied to a summing circuit with the output of the summing circuit being supplied to a comparator through a function generator circuit. The function generator output is compared with a reference level in the comparator circuit with the output of

the comparator being used to energize a relay that controls a solenoid between the air supply and the G-suit. The function generator programs pressure to the G-suit according to a particular function of the output signal of the summing circuit. A pressure signal from the pressure suit and rate of change in suit pressure signal are summed in a second summing circuit with the output of the second summing circuit being used as a third input to the comparator circuit.

3,780,724

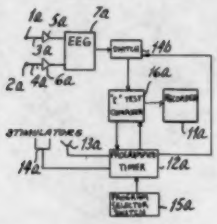
SENSATION-COGNITION COMPUTER EMPLOYING "T" TEST CALCULATIONS

Erwin Roy John, Riverdale, N.Y., assignor to Neuro-Data, Inc., Cliffside Park, N.J.

Continuation-in-part of Ser. No. 877,948, Nov. 19, 1969, abandoned. This application Aug. 20, 1971, Ser. No. 173,604

Int. Cl. A61b

U.S. Cl. 128—2.1 B **5 Claims**



A patient who may be unable to cooperate is tested for auditory, visual and somatosensory perception. The apparatus includes an electroencephalograph, programmed stimulators, a *t* test computer including an average response computer and a recorder. Evoked responses of the patient are elicited and the patient's short-term memory is tested.

3,780,725

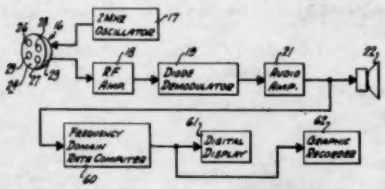
FETAL HEARTBEAT MONITORING SYSTEM WITH PLURAL TRANSDUCERS IN ONE PLANE AND AT DIFFERENT ANGLES THERETO

Paul R. Goldberg, East Palo Alto, Calif., assignor to Smith Kline Instruments, Inc., Palo Alto, Calif.

Filed Mar. 4, 1971, Ser. No. 120,970

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 T **5 Claims**



Fetal heartbeat monitoring system in which a plurality of ultrasonic beams are transmitted at different angles into the uterus of an expectant mother. A plurality of receiving transducers are inclined at different angles for receiving the signal as it is reflected from the fetus and/or uterus walls, the frequency of the reflected signal differing from that of the transmitted signal by an amount corresponding to the rate of the fetal heart motion. A system of rate computation from the resultant doppler fetal heart motion signal is employed which utilizes frequency domain techniques. The heart rate signal is extracted from the doppler heart motion signal by means of a diode demodulator and low frequency band pass filter.

3,780,726

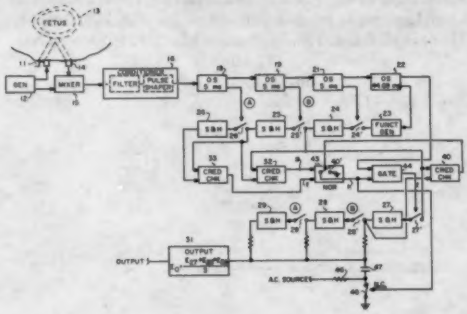
HEARTBEAT RATE MONITORING

Fred Louis Hatke, Skillman, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 205,948, Dec. 8, 1971. This application July 13, 1972, Ser. No. 271,307

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 T **4 Claims**



Apparatus for monitoring the heartbeat rate of a patient comprising deriving, with pulse forming circuitry, electrical signals representative of heartbeat activity on a beat-to-beat data basis, a gating unit for normally passing the electrical signals, a first unit analyzing three successive ones of the electrical signals by a pair of credence checkers each having a preselected frequency tolerance to define a first criterion for distinguishing valid data and artifact and inhibiting operation of the gating unit upon detection of artifact, and a storage unit for receiving and averaging valid data over a period of three successive heartbeats to provide an output indicative of heartbeat rate. A second analyzing unit compares the third one of said signals with the last passed good data to define a second criterion for distinguishing valid data and artifact and upon detection of valid data inhibiting any effect on the gating unit by the first analyzer unit. Passed values are averaged and displayed and a visible indication denotes occurrence of an artifact.

3,780,727

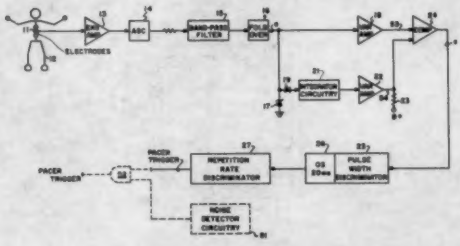
CARDIAC PACER MONITORING MEANS WITH RATE AND PULSE DISCRIMINATION

Eugene King, Yardley, Pa., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 25, 1972, Ser. No. 229,422

Int. Cl. A61b *5/04*

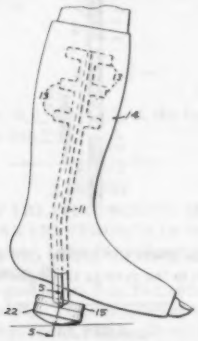
U.S. Cl. 128—2.06 R **6 Claims**



In a cardiac pacer monitoring system for use with pacer patients, apparatus for deriving reliable pacer trigger signals from electrocardiac activity including, processing the electrocardiac signal to exclude QRS and 60 Hz problems, integrating the processed signal to act as a threshold control, comparing the processed signal with the threshold and dis-

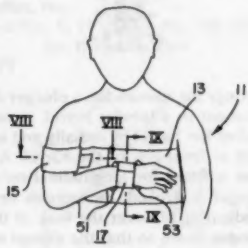
criminating the comparator output with pulse width discriminator and repetition rate discriminator means.

3,780,728
WALKING DEVICE
Richard O. Stader, 163 Harvest Ln., Chambersburg, Pa.
Filed Aug. 1, 1972, Ser. No. 276,975
Int. Cl. A61f *5/04*
U.S. Cl. 128—83.5 **1 Claim**



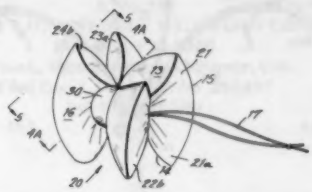
The combination of a stiff splint-like device for application to a cast on the user's lower leg and foot and tiltable therewith relative to the ground surface, and a ground-engaging resilient member rotatable horizontally about the upright axis of the device.

3,780,729
UNIVERSAL SHOULDER IMMOBILIZING SUPPORT
Robert E. Garnett, Memphis, Tenn., assignor to Richards Manufacturing Company, Memphis, Tenn.
Filed Dec. 28, 1971, Ser. No. 212,958
Int. Cl. A61f *5/40*
U.S. Cl. 128—94 **4 Claims**



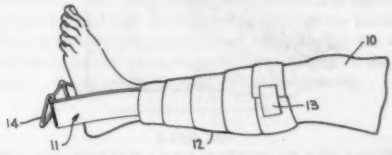
A support intended to be used to immobilize either shoulder of any one of a wide range of different size persons. The support includes a chest band having an open cell plastic foam sheeting, e. g., a polyurethane reticulated foam, constituting the inner surface thereof and a Velcro sensitive material covering the outer surface, a Velcro hooked member is attached to one end of the chest band for overlapping and grippingly engaging the outer surface to detachably hold the chest band snugly around the chest of different size persons. An upper arm band is included which may be detachably secured to the chest band at infinite locations thereon selectively for the size of the user for immobilizing the upper arm of the user. Also included is a wrist band which may be detachably secured to the chest band at infinite locations thereon selectively for the size of the user, thus immobilizing the forearm of the user.

3,780,730
CONTRACEPTIVE
Abner I. Weisman, 162 E. 95th St., New York, N.Y.
Filed May 28, 1971, Ser. No. 147,798
Int. Cl. A61f *5/46*
U.S. Cl. 128—127 **6 Claims**



A six-way acting vaginal contraceptive having a body of sponge-like resilient compressible absorbent material, the body being initially compressed on one axis by a string and on the other axis by a band to form two bifurcated butterfly ends which in turn form a pair of barriers across the vaginal canal, the inner barrier being adapted to lie against the cervix of the uterus and the edges of the butterfly ends being adapted to block the vaginal fornices. The barrier ends are impregnated with a spermicide and at least one end may be impregnated with a coital lubricant.

3,780,731
TRACTION STRIP
Henry A. Quello, Warsaw, Ind., assignor to Zimmer Manufacturing Company, Warsaw, Ind.
Continuation-in-part of Ser. No. 811,087, March 27, 1969, Pat. No. 3,536,072. This application Oct. 26, 1970, Ser. No. 83,705
Int. Cl. A61f *13/00*
U.S. Cl. 128—169 **10 Claims**

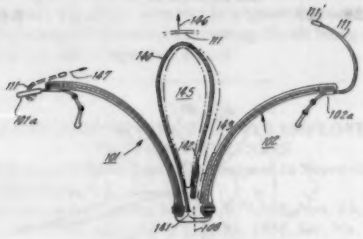


A traction strip comprising an outer layer of a spun bonded polyester and an inner layer selected from the group consisting of a cellular hydrophobic and a cellular hydrophillic sponge material bonded to one surface of the outer layer thereby forming a laminate.

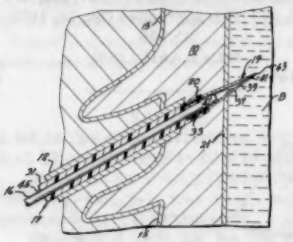
3,780,732
NON-GRAVITATIONAL INFUSION SET
Saul Leibinsoh, 11 Hagardom St., Rishon Lezion, Israel
Continuation-in-part of Ser. No. 753,405, Aug. 19, 1968, Pat. No. 3,595,232. This application Apr. 8, 1971, Ser. No. 132,516
Int. Cl. A61m *5/14*
U.S. Cl. 128—214 F **2 Claims**

A pressure-applying device for use in an infusion set for feeding blood, saline solution or other fluids from a compressible bag to a catheter or needle for administration to a patient. The device comprises at least a pair of highly resilient, arcuate shaped metallic plates pivoted along their adjacent edges and drawn together along their free edges by buckles or clasps. When pivoted into facing relation the adjacent convex surfaces of the plates act to squeeze fluid from the compressible

bag when positioned therebetween. Use of the device obviates the necessity to elevate the infusion bag during use, since infusion is effected by positive pressure rather than by gravity alone.



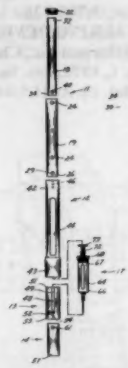
3,780,733
CATHETER
Manuel Martinez-Manzor, 19755 S.W. 304th St., Homestead, Fla.
Filed July 24, 1972, Ser. No. 274,438
Int. Cl. A61m *5/00*
U.S. Cl. 128—215 **5 Claims**



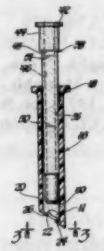
For use in administering continual spinal anesthesia, a catheter for longitudinal movement within the lumen of a relatively large needle used to approach just about to the spinal column to the end of the catheter, a thin needle with a through opening is secured and a stylet is provided in the catheter to advance the small needle relative to the large needle to pierce the wall of the spinal column in a relatively fine opening through which the anesthesia is administered.

3,780,734
HYPODERMIC SYRINGE HOLDER AND INJECTOR DEVICE
Goldwyn L. Wulff, 680 Nebraska Ave. S.W., Huron, S. Dak.
Filed Dec. 10, 1971, Ser. No. 206,787
Int. Cl. A61m *5/22*
U.S. Cl. 128—218 R **6 Claims**

A hypodermic syringe holder and injector device for use in the injection of large animals; the device includes a barrel, a telescoping handle member slidably mounted in the barrel, a syringe and needle guard retainer removably secured to the barrel and a needle guard slidably mounted in the retainer wherein the device is operable by placing the end of the needle guard against the hide of an animal and then pushing on the handle to thus insert the needle into the hide and then to eject the contents in the syringe through the needle.



3,780,735
DOSE SYRINGE
John A. Crouter, 1400 S. Elms Rd., Flint, Mich., and Richard J. Havas, 10259 W. Bristol Rd., Swartz Creek, Mich.
Filed Feb. 3, 1972, Ser. No. 223,243
Int. Cl. A61d *7/00*; A61m *31/00*
U.S. Cl. 128—223 **1 Claim**

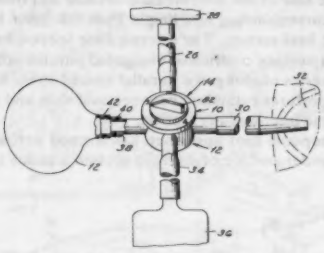


This dose syringe for animals has a plunger disposed for longitudinal movement in a tubular barrel. A medicating pill is held in the end of the barrel by radially and inwardly extending tabs hinged to front end of the barrel. A plunger longer than the barrel is fitted for longitudinal movement therein. When the plunger is stroked, the smooth tip of the plunger pushes the medicating pill over the base of the tongue while holding the tongue down so that the animal swallows the pill without gagging or similar distress. The plunger is tubular with a longitudinal passage completely therethrough and may be used to administer liquid medication to an animal.

3,780,736
SURGICAL VALVE ASSEMBLY FOR URINARY BLADDER IRRIGATION AND DRAINAGE
Allen S. Chen, 11933 Belleville Rd., Belleville, Mich.
Filed Oct. 20, 1972, Ser. No. 299,357
Int. Cl. A61m *1/00*
U.S. Cl. 128—231 **8 Claims**

An arrangement for irrigating a patient's bladder following prostate or bladder surgery which includes a four-position valve having four ports, the valve core being rotatable for interconnecting any two of the four ports so that the bladder may be irrigated with fluid by means of a compressible bulb or syringe connected to one of the ports and the bladder may also

be conventionally drained into a bedside urinary bag without physically disconnecting the valve from either the urinary



catheter, the source of irrigating fluid, the bulb or syringe, or the urinary drainage bag.

3,780,737

A METHOD OF TREATING BOVINE MASTITIS BY MEANS OF AN ERYTHROMYCIN SOLUTION

John Alexander Banford, Lake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. Nos. 562,107, July 1, 1966, abandoned, and Ser. No. , , Continuation of Ser. No. 720,452, April 11, 1968, abandoned. This application Mar. 9, 1971, Ser. No. 122,499

Int. Cl. A61m *31/00*

U.S. Cl. 128—260 **4 Claims**

A method of treating bovine mastitis by injecting through the teat orifice of an infected quarter a solution of erythromycin in a fatty acid triglyceride having an iodine value of less than 42. This method, by virtue of the unique solution offers not only effective mastitis control, but also the distinct advantage of a shorter period of detactable drug residue in the milk than heretofore obtainable. Milk taken after the third milking following the last treatment is free from detectable erythromycin residue.

3,780,738

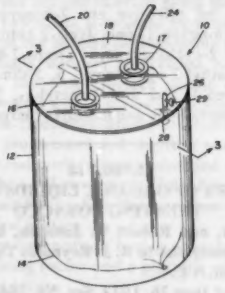
METHOD AND APPARATUS OF MEDICAL SUCTION

David W. Deaton, Dallas, Tex., assignor to Deaton Medical Company, Dallas, Tex.

Filed Dec. 8, 1971, Ser. No. 206,093

Int. Cl. A61m *1/00*

U.S. Cl. 128—277 **9 Claims**



The specification discloses a medical suction apparatus including a generally rigid container for supporting a flexible drainage bag. A drainage conduit extends between the bag and the exterior of the container for connection to an area to be drained and a vacuum conduit extends from the bag to the exterior of the container for connection to a source of reduced pressure. A port extends through the walls of the flexible container to the space between the container and the flexible bag. A valve is disposed in the port for allowing air in the space to be removed in order to maintain the bag in an open position during suction operation. In one embodiment of the invention, air is removed from the space between the bag and the container by applying pressurized air to the interior of the bag. In another embodiment of the invention, air is removed between the bag and the container by the application of suction to the port.

3,780,739

DRAINAGE BAG ASSEMBLY WITH FLOW CONTROL FOR BODY FLUIDS

Mathilda C. Frank, 1800 E. 84th Ave., Denver, Colo.

Filed Dec. 7, 1971, Ser. No. 205,687

Int. Cl. A61f *5/44*

U.S. Cl. 128—283 **14 Claims**

A drainage bag assembly for containing body fluids of a patient includes a flat, generally oval-shaped envelope having a lower outlet opening. A receiving opening is located in an upper portion of the envelope which is surrounded by a flexible sealing ring for releasable sealing attachment of the bag to a flanged holder shield secured to the patient's body. An internal flow control valve permits fluid flow received in the receiving opening to pass into a storage chamber in the bottom of the envelope but inhibits reverse back-flow through the valve. In one form an on-off valve controls the discharge of the fluid contained in the envelope through the outlet opening.

3,780,740

INTUBATION DEVICE AND METHOD OF ADVANCING A TUBE PAST THE PYLORUS

James W. Rhea, 501 Alabama St., Bristol, Tenn.

Filed Nov. 1, 1972, Ser. No. 302,808

Int. Cl. A61m *25/00*

U.S. Cl. 128—350 R **7 Claims**

An intubation device providing communication into a patient's intestine. The device is formed of a soft flexible tube having a weighted front end, a soft flexible sleeve slidably mounted on the tube, and a collar mounted on the front end of the tube in registry with the sleeve. The front end of the device is inserted through a nasal passage of the patient and is advanced, by the coaction of the weighted plug and the advancement of the sleeve against the collar, to bring the plug and the front of the tube into the patient's stomach up to the pylorus. The sleeve is then withdrawn with respect to the collar and tube, then readvanced carrying the tube so as to provide slack in the front of the tube so that the coaction of peristalsis and the weighted plug will effect a transpyloric passage of the plug

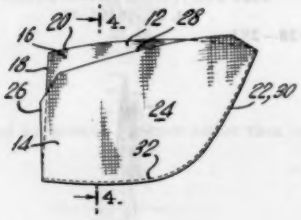
and the leading end of the tube. A passage extends between the interior and exterior of the tube at or near the front of the tube to permit fluid to flow between the tube and the intestine.

3,780,741

BREAST CUP CONSTRUCTION

Raymond C. Cole, Hillsdale, N.J., assignor to International Playtex Corporation, New York, N.Y.

Filed June 16, 1971, Ser. No. 153,522
Int. Cl. A41c *3/00*
U.S. Cl. 128—516 **8 Claims**



A breast receiving cup for a brassiere, and the method of manufacturing the cup, are disclosed in which the cup comprises an upper cup portion having a lower joining edge of predetermined curvature and a lower cup portion having an upper joining edge secured to the lower joining edge of the upper cup portion. The upper joining edge of the lower cup portion has the same predetermined curvature as the lower joining edge of the upper cup portion whereby the lower joining edge and the upper joining edge of the respective cup portions may be superimposed upon one another to facilitate securement of the upper and lower breast cup portions to one another during the manufacturing procedure. In the three-dimensional finished cup the resultant line of securement starts at a first point along the inner edge of the cup and extends towards its terminus at the outer edge of the cup. Depending upon the cup presentation desired, such line of securement will extend between such first point and its terminus without the line of securement dipping vertically below said first point. Conversely the line of securement may extend from a first point along the inner edge of the cup to its terminus at the outer edge of the cup without the line of securement extending above said first point. Moreover, such construction facilitates the utilization of, and makes possible the optimum use of a split seam construction for concealment of the seam line through sheer garments which is compatible to the less structured, rounder, softer and more natural look of today's fashion.

3,780,742

ORTHOPEDIC FOOT APPLIANCE

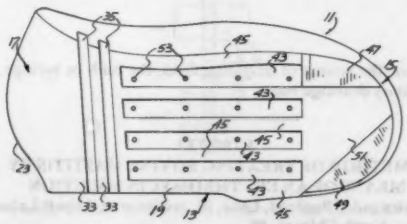
Milton H. Madgy, 29199 Wellington Ct., Apt. 46, Southfield, Mich.

Filed Sept. 11, 1972, Ser. No. 288,103
Int. Cl. A61f *5/14*
U.S. Cl. 128—588 **4 Claims**

An orthopedic foot appliance of resilient plastic that has a heel portion, of varying angles, a front section and an intermediate section, said sections and portion being of varying thickness. The front section is longitudinal convex-concave at its top and bottom with a thin forwardly extending convex tip. The intermediate section is longitudinally planar substantially along its top and bottom. The heel portion at the bottom has a rearwardly converging horizontally planar intermediate section and rearwardly converging inner and outer planar heel sections which are inclined upwardly and outwardly thereto.

An inner border extends along the top and is curved upwardly and outwardly and is of progressively increasing height from a limited height at the side of the front section to maximum height at the intermediate portion and slopes down and around the heel portion. The outer border is curved upwardly and outwardly of similar progressively increasing height, but starts at the side of the intermediate section and from front to rear is of corresponding less height than the inner border, to meet at the heel section. The intermediate section has formed in its under surface a series of elongated parallel spaced slots defining a series of elongated parallel spaced stress bars, there being air apertures extending between said slots and the upper surface of the intermediate section.

The orthopedic foot appliance has formed across the forward and under surface of its front section a series of parallel



spaced transverse slots. There are transversely extending adjustment insert wedges of specific design and backing which have a flat under surface and upwardly extending elongated ridges which are snugly and removably nested frictionally in said transverse slots. The wedges have surfaces tapered at angles in the range of 2°–6°.

A metatarsal type insert pad has a longitudinal body of specific design with a flat under surface and has upstanding elongated ridges which fit snugly and removably nest in said transverse slots. Said body surface is flat transversely and tapers inwardly from front to rear to underlie a portion of the intermediate section.

3,780,743

FLAVORED TOBACCO PRODUCT

Donald L. Roberts, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sept. 18, 1972, Ser. No. 289,856
Int. Cl. A24b *15/04*
U.S. Cl. 131—17 **10 Claims**

Addition of mesityl oxide condensation products to tobacco to enhance the flavor and/or aroma thereof.

The identifiable compounds in the condensation which have been found to be effective are 2-isopropenyl 1-3, 5, 5-trimethyl-2- cyclohexen-1- one, 1(cis-2 ketopropylidenyl) -3, 5,5 -trimethyl -2-cyclohexene, 1-(trans-2-ketopropyl- lidenyl)-3, 5,5-trimethyl-2-cylohexene, 5, 5-dimethyl -3-isobutenyl-2- cyclohexen-1- one and 2-acetyl-1-, 3-di dimethyl -4-isopropylcyclopentadiene and mixtures thereof.

3,780,744

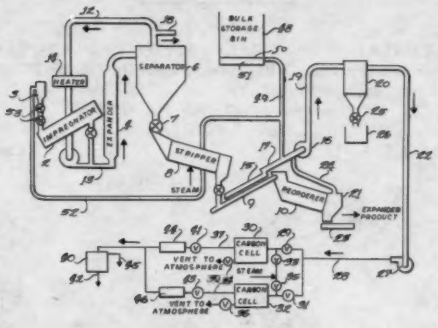
RECOVERY OF ORGANIC LIQUIDS USED FOR TREATING TOBACCO

Robert M. Neel, and Robert C. Johnson, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed June 26, 1972, Ser. No. 266,433
Int. Cl. A24b *3/18*
U.S. Cl. 131—143 **3 Claims**

The recovery of a vaporized organic liquid in a process for expanding tobacco in which tobacco impregnated with the organic liquid is heated to a temperature substantially above the boiling point of the organic liquid with the expanded tobacco being subsequently separated from the vaporized organic liquid. The recovery of organic impregnant is accomplished by collecting and combining impregnant-containing gases from various processing operations, removing entrained solid parti-

cles from the combined gas stream by passing through a separator, removing organic impregnant from the gas stream



by passing through a bed of activated carbon and reclaiming the organic impregnant from the activated carbon.

3,780,745

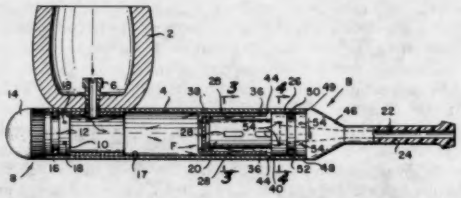
BIT CONSTRUCTION FOR SMOKING PIPES

Robert L. Smith, and William O. Smith, both of Stag Park Road, N.C.

Filed July 21, 1972, Ser. No. 273,759

Int. Cl. A24f *01/16*

U.S. Cl. 131—212 A **14 Claims**



A bit member having a smoke duct therethrough for use in combination with a smoking pipe including a bowl, a tubular stem for connecting the bowl to the bit and a receptacle-like retroverted-flow filter associated with the bit and disposed within the stem. The bit member comprises a generally tubular first portion adapted to fit telescopically within the stem, a generally tubular second portion adapted to fit telescopically within the filter, the second portion being coaxial with said first portion and extending forwardly from the first portion, the outer surface of the second portion being provided with a series of substantially uniform projections circumferentially disposed thereon, the outer surface of the second portion being further provided with a series of substantially uniform second projections circumferentially disposed thereon intermediate the first projections and the first portion, the outer surface of the second portion being provided with stop members for limiting the axial movement of the filter on the second portion, and a mouthpiece-like third portion extending rearwardly from the first portion.

The bit member first portion is also provided with a transverse O-ring retaining recess and a plurality of protuberances on each side of the recess.

3,780,746

COMBINATION VANITY TRAY AND MIRROR

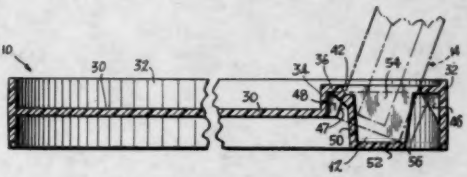
Thomas H. Hayes, Westport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Apr. 13, 1973, Ser. No. 350,968

Int. Cl. A45d *33/00*

U.S. Cl. 132—83 R **7 Claims**

A combination vanity tray and mirror wherein the tray has a socket arranged to receive the mirror handle in either of two sloped positions, extending either forward toward or rearward from the user. The socket, located in a peripheral portion of the tray, can be disposed either close to the user or more remote from the user by turning the tray. For the close position, the mirror handle extends over the tray and for the remote position, the handle extends oppositely, away from the tray. The mirror is double faced, having a planar reflecting surface at one side and a magnifying reflecting surface on its other side. Thus four different combinations are possible, in-



volving the mirror. For a close positioning, the mirror can provide either a true image or else a magnified image, and such images can also be had for the remote position. In connection with the latter, the tray can be extended under the face of the user so as to catch powder and cosmetic particles that drop down during use. For the close-up position of the mirror, the thin mirror handle and disposition of the mirror proper still permit easy access to the tray. When dismantled, the mirror and tray can be nested flat to occupy a small space for storage and shipping.

3,780,747

APPARATUS FOR CLEANING FILTER PLATES AND THE LIKE

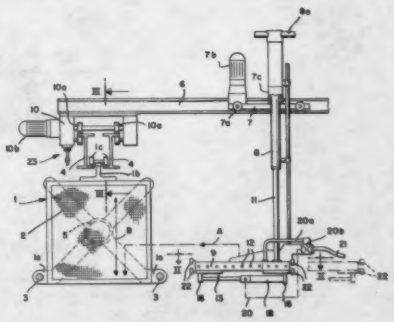
Werner Stadie, Kettwig; Kurt Sperling, Essen; Rolf Deubner, Bochum, and Werner Pattberg, Essen, all of Germany, assignors to Pumpen und Maschinenbau Abel Kommanditgesellschaft, Essen, Germany

Filed Apr. 5, 1972, Ser. No. 241,199

Claims priority, application Germany, Apr. 21, 1971, P 21 19 295.0; Apr. 21, 1971, P 21 19 296.1

Int. Cl. B08b *3/02*

U.S. Cl. 134—43 **13 Claims**



A stack of flat plates consisting of rectangular frames spanned by filter cloth, normally held together under pressure, is overlain by a rail extending lengthwise of the stack and carrying a transverse beam on which a carriage supports a cleaning unit introduceable from the side into the space between two separated filter plates. The unit comprises a pair of horizontal or vertical spray tubes, each extending over the full width or height of the filter cloth, which are vertically or horizontally movable with the aid of a pair of guide rollers riding on opposide edge portions of the frame when driven apart by a fluid-operated expander. The correct positioning of the beam with reference to the separated filter plates can be

ascertained by a centering device adapted to be lowered into the intervening space, this device including two spreadable arms terminating in respective sensing rollers.

3,780,748

COLLAPSIBLE UMBRELLA

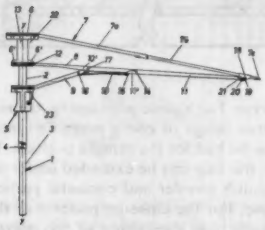
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Calif.

Filed May 22, 1972, Ser. No. 255,425

Claims priority, application Germany, May 21, 1971, P 21 25 295.9

Int. Cl. A45b *19/04*

U.S. Cl. 135—20 R **4 Claims**



An umbrella having a telescopic stick and each dome rib has three telescopic sections and a parallelogram support structure including a foldable stretcher member hinged midway thereof connected to the dome ribs and to a fixed pivot point on the stick spaced from the crown. A strut member is pivoted to the stretcher members and is hinged to a movable runner on the stick.

3,780,749

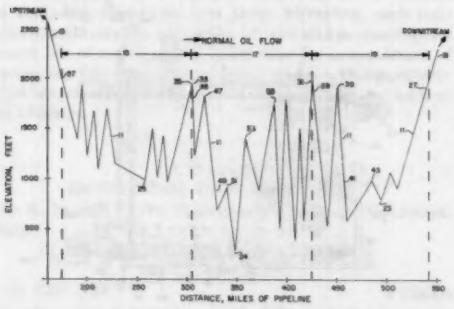
PROCEDURE FOR ASSISTING RENEWAL OF OIL FLOW IN A PIPELINE

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 312,049

Int. Cl. F17d *1//16*

U.S. Cl. 137—13 **9 Claims**



When the temperature is cold enough to gel quiescent oil, renewal of oil flow through a section of pipeline following uphill and downhill terrain is assisted after shutoff by a procedure conducted at an appropriate location along the pipeline where counterbalancing hydrostatic head pressures caused by elevation differences are exerted on both sides of the location. The hydrostatic head pressure exerted on one side of the location, preferably the upstream side, is first decreased by removing oil by pumping or drainage from that side while maintaining at some time during such removal a higher hydrostatic pressure on the other side of the location. Thereafter, shortly before restoring oil flow through the section, oil is caused to flow from the other side of the location into the side of decreased hydrostatic pressure.

3,780,750

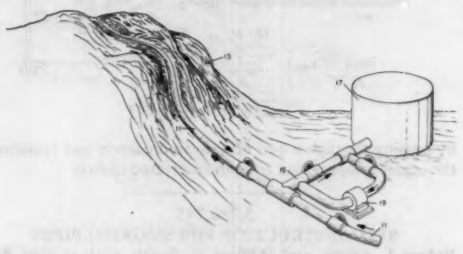
FACILITATING RENEWAL OF OIL FLOW IN A PIPELINE

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 312,050

Int. Cl. F17d *1//16*

U.S. Cl. 137—13 **7 Claims**



Renewal of oil flow through a section of pipeline in which quiescent oil has gelled is facilitated by causing a segment of the gelled oil to yield in either an upstream or downstream direction. A portion of the yielded segment is removed from the pipeline. Liquid oil of relatively low resistance to flow as compared to the yielded segment is passed through the section of the pipeline previously occupied by the yielded segment. Thereafter, the removed oil is returned into the pipeline. The yielded segment may be removed at an elevation below a significant portion of the segment of the gelled oil to be yielded. If the elevation difference is in a downstream direction, removal of the yielded segment may be used to decrease the hydrostatic pressure resisting renewal of oil flow. The hydrostatic head pressure caused by this elevation difference may be used to yield the segment of gelled oil and to cause a portion of the yielded segment to flow from the pipeline. As a less desirable alternative, a displacing fluid may be used to cause the segment of gelled oil to yield and flow from the pipeline.

3,780,751

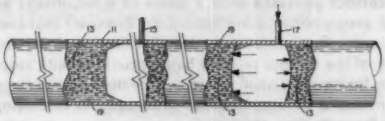
RESTORING OIL FLOW IN A PIPELINE

Ralph E. Styring, Jr., Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 4, 1972, Ser. No. 312,051

Int. Cl. F17d *1//16*

U.S. Cl. 137—13 **20 Claims**

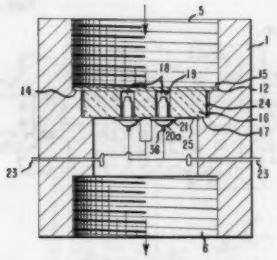


Liquid oil flow capacity through a portion of a pipeline blocked by cooled, gelled, stationary oil is restored at a lower than normal startup pressure. The blocked portion is divided into segments by spaced-apart injection points. A fluid, preferably a gas, is injected under controlled pressure into the injection points to displace the separate gelled segments and to degrade the gel strength of each displaced segment to the point that liquid oil flow through the blocked portion can be restored at a lower startup pressure. The fluid may be injected into the injection points simultaneously or sequentially. The individual segments may be displaced in an upstream direction, or in a downstream direction, or in both directions, toward naturally-occurring or artifically-created unblocked flow points.

3,780,752
EXPLOSIVELY ACTUATED VALVE

Kenneth W. Noddin, Wenonah, N.J., and Walter J. Simmons, Falling Waters, W. Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 1, 1971, Ser. No. 119,645
Int. Cl. F16k *17/40*
U.S. Cl. 137—68 4 Claims

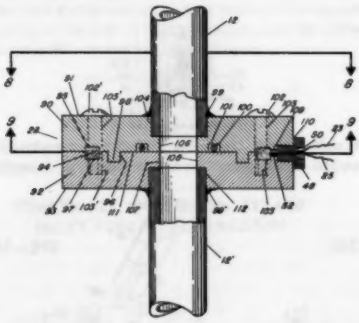


An explosively actuated valve sealed by a frangible diaphragm, e.g., tempered glass, which is opened with an expandable electroexplosive device which fractures the frangible diaphragm. The frangible diaphragm can be used in combination with a rupture disk.

3,780,753
IN-LINE EXPLOSION ARRESTER

Louis Jablansky, Fair Lawn, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 139,337, May 3, 1971, Pat. No. 3,739,796.
This application Dec. 12, 1972, Ser. No. 314,299
Int. Cl. F16k *13/00*
U.S. Cl. 137—68 1 Claim



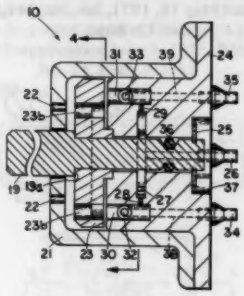
This invention relates to a system for detecting an explosion in a pipeline carrying molten explosive material and halting the spread thereof by blocking the propagation of the detonating wave by a detonation arresting means that is electrically activated by an electronic switch which is sensitive to the initial detonation.

3,780,754
FLUIDIC ANGULAR SHAFT POSITION SENSOR

Sergie Onufreiczuk, Audubon, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 1, 1972, Ser. No. 285,773
Int. Cl. F15b *5/00*
U.S. Cl. 137—82 2 Claims

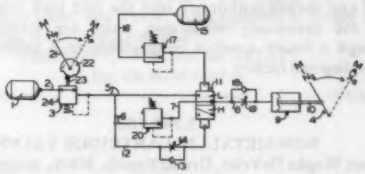
A shaft position indicating system for measuring and indicating the angular position of a shaft. A pair of fixed, diametrically opposite nozzles, connected through fixed orifices to a fluid pressure source, confront a plate rotatingly fixed to the shaft with a noncircular, continuous groove symmetrical about its own axis with its locus displaced from the shaft axis, and having pressure relief holes angularly spaced through the plate at the groove. The position of the groove relative to the nozzles determines a back pressure differential linearly indicative of the angular position of the shaft.



3,780,755
AUTOMATIC SPEED CONTROL MEANS FOR A MARINE ENGINE

Tsutomu Matsuda, Akashi, and Makoto Takagi, Kobe, both of Japan, assignors to The Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Nov. 2, 1971, Ser. No. 194,899
Claims priority, application Japan, Nov. 5, 1970, 45/97423
Int. Cl. F16k *31/14*; F15b *13/042*; F02d *11/02*
U.S. Cl. 137—110 9 Claims

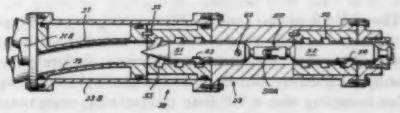


Suppression apparatus interposable between an operator's speed controller and a throttle device in a fluid pressure operable speed control system for a marine engine driving a propeller carried on a propeller shaft, all of which, therefore, are subject to the phenomenon of vibratory resonance occurring within a critical range of speeds or rpm of the engine, said suppression apparatus being operative for automatically suppressing the effectiveness of that portion of a change-of-speed signal, when initiated by the operator, that would, in the absence of such suppression apparatus, produce an engine speed falling within low and high engine speed limits defining said critical range.

3,780,756
SWITCH

John V. Pennington, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Continuation of Ser. No. 121,883, March 8, 1971, abandoned.
This application Nov. 22, 1972, Ser. No. 308,796
Int. Cl. G05d *11/00*
U.S. Cl. 137—119 39 Claims

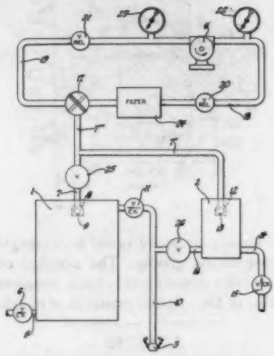


A switch for fluidly connecting a pipeline with a selected branch line in response to the passage of a tool therethrough.

3,780,757
WASTE DISPOSAL SYSTEM AND METHOD

Richard J. Jordan, Roseville, Mich., assignor to General Marine, Inc., Bloomfield Hills, Mich.

Filed May 10, 1971, Ser. No. 141,569
Int. Cl. B08b *3/00*
U.S. Cl. 137—205 2 Claims

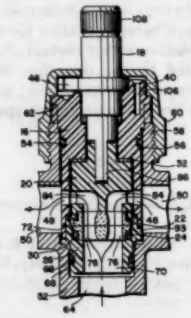


Vacuum and pressure are selectively applied by an air pump through a conduit interconnecting two tanks which have a second interconnecting conduit connectable to the access fitting of a boat waste receptacle. Application of vacuum withdraws the waste from the receptacle into one of the tanks and lake water into the second tank through a third conduit whose inlet end can be dropped overboard. The lake water is then expelled by air pressure into the receptacle as a flushing fluid and thence withdrawn into the first tank from which it and the previously withdrawn waste are finally expelled through a fourth conduit connectable to a public sewer or other disposal facility.

3,780,758
NON-METALLIC CARTRIDGE VALVE

Robert Wopke DeVries, Grand Rapids, Mich., assignor to Wolverine Brass Works, a Division of Wolverine Industries, Inc., Grand Rapids, Mich.

Filed Nov. 15, 1972, Ser. No. 306,598
Int. Cl. F16k *25/00*
U.S. Cl. 137—454.6 20 Claims

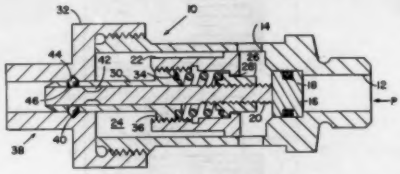


The valve is of the replaceable cartridge or unit type, and is constructed mainly of durable non-metallic materials which resist corrosion, wear, and adherence of foreign materials usually carried by the fluid under control of the valve; the valve featuring also a 90° limit of operating stem rotation and a minimum number of simple components capable of fabrication and assembly with great savings of time and labor so that the valve may be produced at low cost.

3,780,759
REUSABLE PRESSURE RELEASE VALVE

Daniel I. Yahle, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1972, Ser. No. 242,553
Int. Cl. F16k *17/06*
U.S. Cl. 137—467 3 Claims

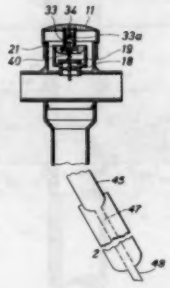


A reusable release valve for use in checking fluid systems, in areas such as missile stage controls, and to dump the fluid at a predetermined pressure. The system fluid causes pressure on a piston to release a latching mechanism whereby the system fluid is dumped through the release valve. After fluid dumping the valve is disassembled and reset for reuse.

3,780,760
VALVE, PREFERABLY FOR ANAESTHETIC PLANTS OF THE CLOSED TYPE

Ole Berner, Herlev, Denmark, assignor to Dameca A/S, Rodovre, Denmark

Filed July 22, 1971, Ser. No. 165,308
Claims priority, application Denmark, July 27, 1970, 3887
Int. Cl. F16k *15/06*
U.S. Cl. 137—516.25 7 Claims

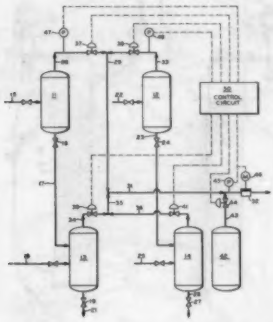


A valve for anaesthetic plants of the closed type, in which a valve plate may move between an upper and lower valve seat. When the plate is in a mean position the anaesthetic mixture may ooze out from the pipe circuit and, when the plate bears against one of the seats the valve is closed. The plate is fixed to a spring and its movement is limited by an elastic member on the valve housing, said member being movable along the axis of the spindle on which the valve plate is fixed. The valve plate is arranged in a central channel which communicates with a ring-shaped chamber, this chamber communicating with an outlet. The valve may be used either for intermittent operation or for operation in such a way that it opens at a pre-determined pressure or for working when the patient is breathing spontaneously because the valve shall invariably allow a certain small surplus quantity to escape the system. Finally the valve ensures that any surplus anaesthetic mixture can be easily conducted to the floor.

3,780,761
APPARATUS INCLUDING AN EQUALIZATION CHAMBER FOR DISCONTINUOUS VENTING OF A VESSEL

Bobbie L. Whitson, and John A. Morgan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 10, 1972, Ser. No. 225,171
Int. Cl. G05d 7/06, 16/18
U.S. Cl. 137—565 **6 Claims**

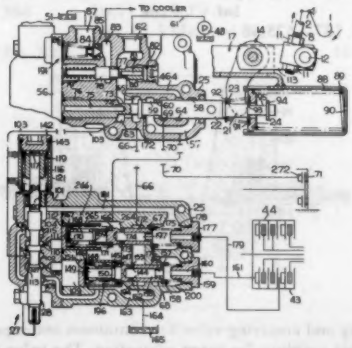


A vessel to be vented on a discontinuous basis is connected by first conduit means, containing a first valve means, to the inlet of a compressor. An equalization chamber is connected by second conduit means, containing a second valve means, to the first condut means at a point between the first valve means and the inlet of the compressor. The valves are selectively actuated to initially connect the vessel and the equalization chamber to permit the gas pressures therein to equalize, then to close off the chamber while the compressor withdraws additional gas from the vessel until the desired pressure is reached, and finally to withdraw gas from the chamber. The equalization chamber and compressor can be employed to sequentially vent a plurality of vessels. A control means can be utilized to perform the selective actuation of the valves.

3,780,762
HYDRAULIC VALVE

Ralph W. Matthews, and Robert E. Schott, both of New Berlin, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1972, Ser. No. 317,644
Int. Cl. F16k 11/10; F16d 67/04
U.S. Cl. 137—596 **10 Claims**

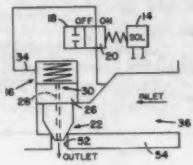


A hydraulic pressure modulated valve for controlling the operation of hydraulic brake and clutches.

3,780,763
PULSE RATIO MODULATION VALVE

Raymond B. Wisniewski, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 859,504, Sept. 19, 1969, abandoned. This application June 2, 1971, Ser. No. 149,345
Int. Cl. F16k 31/363
U.S. Cl. 137—599 **3 Claims**

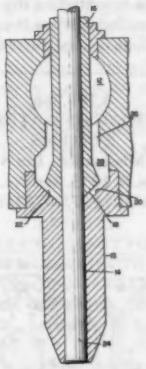


A valve disposed for use in a rocket having thrust vector control means for attitude control of the rocket. The valve is operated by a normally-open two-way solenoid cartridge which controls a spring actuated disk valve for venting pressurized fluid from behind the valve pintle. The normally-open solenoid provides fluid control pressure for pintle closing and prevents valve pintle vibration during rocket engine vibration. In response to closing of the solenoid, the control pressure behind the pintle is vented and fluid supply pressure displaces the pintle from blocking an exit port in the valve body to provide fluid pressure flow therethrough.

3,780,764
NOZZLE SHUT-OFF AND FLOW CONTROL VALVE

Robert Joseph Geist, Isla Verde, P.R., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,177
Int. Cl. B29f 1/00
U.S. Cl. 137—613 **3 Claims**

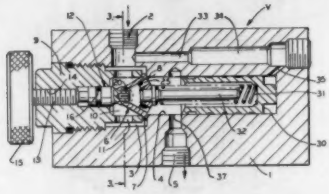


A combined nozzle shut-off and flow control valve for use with a plastic molding machine is disclosed comprising a valve body having a bore communicating with outlet passage means of reduced diameter and axially aligned with said bore and radial inlet passage means; a valve stem, having an inner axial passage, axially positioned within said bore and capable of relative axial movement therein; nozzle valve rod means slidably positioned in said valve stem inner axial passage and aligned to register in to effect closure of said outlet passage means; the lower surfaces of said bore and said valve stem having parallel annular surfaces providing a gap of variable width to effect flow control through said valve.

3,780,765
RESTRICTIVE FLOW REGULATING VALVE AND CONTROL CIRCUIT EMPLOYING SAME

Eugene E. Swatty, Euclid, Ohio, assignor to Fluid Controls, Inc., Mentor, Ohio

Filed Aug. 16, 1971, Ser. No. 172,137
Int. Cl. F16k 31/143
U.S. Cl. 137—613 1 Claim



The restrictive flow regulating valve has a plug which is adjustable axially of a complementary valve sleeve to expose different lengths of a slot in the plug, dependent on the adjusted position of the plug, for predetermining different basic flows. The plug and sleeve have a lapped fit.

Concentricity of the plug and sleeve is assured during valve assembly by driving the plug into the sleeve while the sleeve is held in the valve body for limited radial movement with its passage normal to the plug axis so that the plug itself moves the sleeve into coaxial relation with the plug. The sleeve is then secured in coaxial relation in the body while so held by the plug.

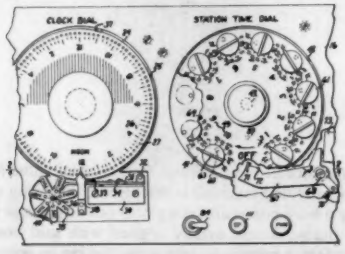
The valve is incorporated in an electro-mechanically operated hydraulic control circuit which controls the cycling of a cutting machine for rapid advance to feed starting position, and slower advance during feed and, optionally, for successive increments of the feed by which the tool cuts progressively deeper into the workpiece, each increment of feed being followed by rapid withdrawal of the tool to clear the chips and each withdrawal being followed, in turn, by a rapid advance to just short of the beginning of the next increment of cut.

The entire control is mounted on the machine itself so that it can remain fully installed relative thereto hydraulically and electrically if the machine is to be moved to a new worksite.

3,780,766
AUTOMATIC TIMING OF WATERING CONTROL SYSTEMS

Gustav A. Link, 3961 Mission Rd., Los Angeles, Calif.

Filed Jan. 8, 1973, Ser. No. 321,790
Int. Cl. A01g 27/00; F16r 31/04
U.S. Cl. 137—624.2 11 Claims

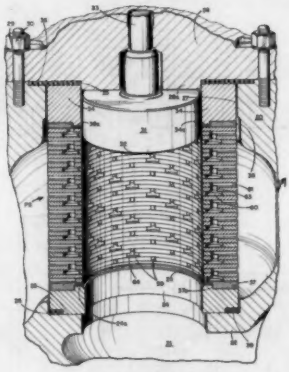


A watering or sprinkling control device for large areas comprising a motor driven timing rotor having timing control knobs at different control stations therearound representing different areas to be successively watered and wherein the knobs are adjustable relative to suitable indicia to predetermine the length of time watering is to occur in respective ones of the areas or, alternatively, to omit watering of such areas.

3,780,767
CONTROL VALVE TRIM HAVING HIGH RESISTANCE VORTEX CHAMBER PASSAGES

Karl Stanley Borg, Westboro, and Henry W. Boger, Westwood, both of Mass., assignors to Masoneilan International, Inc., Norwood, Mass.

Filed Dec. 18, 1972, Ser. No. 316,038
Int. Cl. F16k 47/04
U.S. Cl. 137—625.3 30 Claims



A control valve trim cage having high resistance, fluid flow energy absorbing, vortex chamber passages opening between the cage bore and circumference.

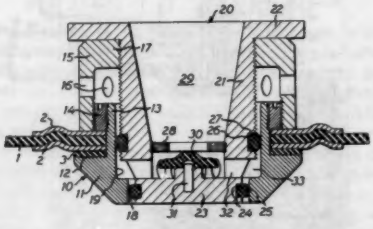
A control valve having a trim cage comprising a stack of like plates together formed with radially and axially distributed, vortex chamber passages extending between the stack walls. The control valve further having a valve plug axially shiftable within said stack to variously cover and uncover said plates and passages and thereby to adjust or regulate fluid flow through said valve.

An improved construction for the high resistance fluid passages of a stacked plate design of control valve trim wherein the passages are provided within or through one or more trim plates and are characterized each by a generally radially disposed, tangential inlet; a single, spiral flow vortex chamber; and a generally radially disposed, non-reversing outlet.

3,780,768
FILLING AND EMPTYING VALVE

Hans Sture Soderstrom, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden

Filed Apr. 5, 1972, Ser. No. 241,261
Claims priority, application Sweden, Apr. 6, 1971, 4443/71
Int. Cl. F16k 11/02
U.S. Cl. 137—625.48 1 Claim



Filling and emptying valve for containers and especially for inflatable cushions for cargo protection. The valve comprises a valve housing for mounting in an opening in a wall of a container or cushion and a valve holding body with emptying, filling and closing valves. The emptying and closing valves

define a valve chamber, in which the non-return type filling valve opens. In the valve housing the valve holding body is movable between three working positions, a first position in which the valve is completely closed, a second position in which the closing valve is open and connects the valve chamber with the interior of the container or cushion and permits filling the container or cushion through the filling valve, and a third position in which the emptying and closing valves are open for connecting the interior of the container or cushion with the atmosphere.

3,780,769

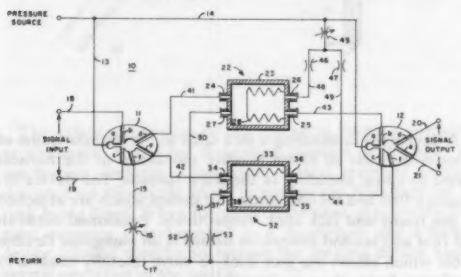
FLUIDIC VARIABLE CAPACITANCE NETWORK

Walter M. Posingies, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 17, 1971, Ser. No. 209,299

Int. Cl. F15c *3/00*

U.S. Cl. 137—819 **4 Claims**



A fluidic variable capacitance network comprising a pair of bellows having non-linear pressure-displacement characteristics enclosed in pressurized enclosures, and an adjustable biasing network for controlling the operating point of the bellows. The capacitance of the bellows with respect to an AC pressure signal is a function of the nominal operating point of the bellows established by the biasing network. Also disclosed is a scheduled variable high pass fluid amplifier utilizing the variable capacitance network.

3,780,770

MULTIPLE INPUT FLUID JET ELEMENT FOR A FLUIDIC CIRCUIT

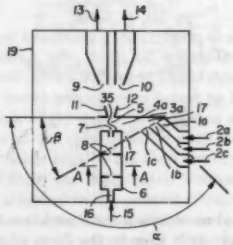
Arnulf Schwarz; Gerhard Konig; Manfred Pieloth, and Dietmar Lang, all of Dresden, Germany, assignors to Veb Reglerwerk Dresden, Dresden, Germany

Filed Mar. 31, 1972, Ser. No. 240,038

Claims priority, application Germany, May 27, 1971, WP F 15 c/ 155 394

Int. Cl. F15c *1/14*

U.S. Cl. 137—823 **10 Claims**



A fluidic circuit device incorporates one or more multiple input fluidic jet elements arranged so that the jet axes of each of the jets is directed to a mixing region at an obtuse angle with respect to a baffle, and the ends of the nozzles of the multiple jet element define a line or plane that is at an acute angle with respect to the baffle. The nozzle system is disclosed in combination with a wall attachment device, as an arrangement to permit the series or parallel combining of signals, and in an arrangement having opposed elements.

3,780,771

FLUIDIC DISPLACEMENT TRANSDUCER

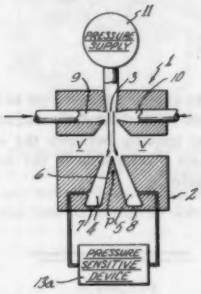
Robert F. Kampe, West Hartford, and Albert H. White, Wethersfield, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Division of Ser. No. 874,856, Nov. 7, 1969, Pat. No. 3,613,708.

This application Oct. 14, 1971, Ser. No. 189,196

Int. Cl. F15c *1/14, 3/10*

U.S. Cl. 137—829 **6 Claims**



A fluid amplifier is provided with pressure surfaces which are movable in response to the pressure differential between two opposed chambers. A power stream impinges on a splitter element which separates two channels which respectively communicate with the chambers, so that a control stream may direct the power stream into either channel and create a pressure differential between the chambers. When the pressure surfaces move, the splitter element again impinges on the power stream annulling the initial pressure differential. Either the splitting element or the orifice of the power stream is connected to the pressure surfaces so as to be movable therewith to change the relative location of the splitter element and orifice. The amplifier may be employed as either a position or force to pressure transducer or a pressure to position or force transducer. A fluidic closed loop pneumatic actuation system incorporates the amplifier to position a servo-valve controlled actuator.

3,780,772

COUPLING ARRANGEMENT FOR PROVIDING UNIFORM VELOCITY DISTRIBUTION FOR GAS FLOW BETWEEN PIPES OF DIFFERENT DIAMETER

Robert D. Carnanhan, Barrington, and Karl J. Youtsey, Chicago, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

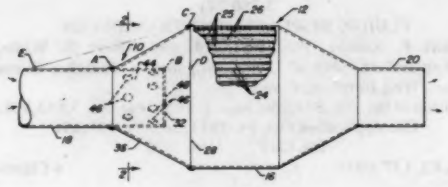
Filed Mar. 2, 1972, Ser. No. 231,141

Int. Cl. F15d *1/02*

U.S. Cl. 138—37 **7 Claims**

Coupling arrangement provides uniform velocity distribution between pipes of different diameters where the diameter differences are greater, and/or the axial spacing of the pipes is less than that which would be required to permit a uniform velocity distribution if a flared connector joined the ends of the two pipes. The coupling includes a frusto-conical transition member which connects the end of the larger pipe to the smaller pipe at a location which is spaced axially from its end. By closing the end of the smaller pipe except for at least one small opening proximate its axis and by providing a series of circumferentially spaced openings around its walls between its

end and the points at which the transition member is attached to it, it is possible to cause gas flow from the smaller to the larger pipe to have a substantially uniform velocity distribution across the end of the large pipe. The coupler is particularly useful in distributing polluted exhaust gases from a rela-



tively small diameter engine exhaust pipe to a relatively larger diameter honeycomb-shaped catalytic reactor element since it permits a minimum spacing between the exhaust pipe and catalytic element and a reduction in the amount of catalyst contained in the reactor.

3,780,773

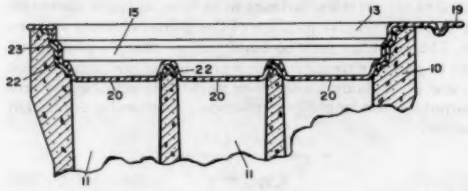
CLOSURE FOR MULTIPLE PASSAGE CONDUIT

Sverre R. Haugen, Lanesboro, Minn.

Filed June 17, 1971, Ser. No. 153,965

Int. Cl. F16l *57/00*

U.S. Cl. 138—89 **3 Claims**



Closures for the respective male and female ends of a conduit are releaseably held on the conduit by frictional engagement with parts carried by the conduit. The closure for the recessed or female end of a multiple passage underground conduit is provided by a dish-shaped member which is formed of plastic sheet material. A plurality of projections extend downwardly from the bottom of the member and are positioned, respectively, in the ends of the passages. A peripheral skirt extending upwardly from the bottom of the member fits snugly in friction—tight engagement with the inner wall of the recessed end of the conduit. The other or male ends of the conduit may be closed by a similar dish-shaped member having projections extending upwardly from the bottom of the passages. A peripheral skirt also extends upwardly and frictionally engages a gasket carried from the outer side of the male end portion of the conduit.

3,780,774

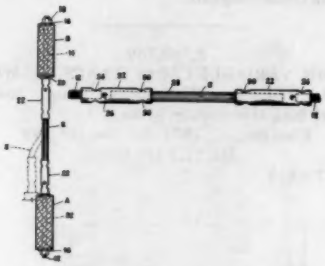
JACK STICK CONNECTOR

Curtis M. Daniel, Rt. 5, Anderson, S.C.

Filed Jan. 27, 1972, Ser. No. 221,309

Int. Cl. D03c *13/00*

U.S. Cl. 139—87 **2 Claims**



A device for connecting a jack stick to the harness frame of a loom in order to effect positive pull-down of the harness frame to cause shedding of the warp threads. The device includes a first and second connector means which are attached to the frame and jack stick, respectively. Positioned between the first and second connector means is an elongated flexible cable which allows the jack stick to move laterally relative to the frame during the weaving operation.

3,780,775

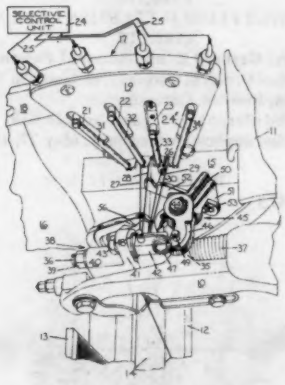
WEFT CONTROL MECHANISM FOR SHUTTLELESS LOOMS

Frederick L. Sprague, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1972, Ser. No. 284,499

Int. Cl. D03d *47/38*

U.S. Cl. 139—122 W **4 Claims**



A weft control mechanism for shuttleless looms of the type adapted to insert weft yarn in the form of pairs of interconnected picks having means for inserting separate picks into the warp sheds which are drawn from separate sources of supply and which are guided to a position for presentation to the inserting means by a single weft presenting member.

3,780,776

SAFETY MECHANISM FOR AUTOMATIC NOZZLES

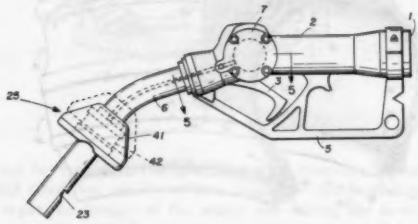
Hans Eric Eklund, Malmo, Sweden, assignor to AB Ljungmans Verkstader, Malmo, Sweden

Filed June 9, 1971, Ser. No. 151,330

Claims priority, application Sweden, June 16, 1970, 8311/70

Int. Cl. B67c 3/26

U.S. Cl. 141—207 9 Claims



The safety mechanism of this invention forms a portion of an automatic nozzle for dispensing gasoline or the like. The mechanism includes a pressure control member movably mounted on the nozzle spout to engage the filler pipe on the tank being filled. When the control member engages the filler pipe, pressure is transmitted to a diaphragm and a locking device carried thereby to release the locking device and to permit operation of the nozzle.

3,780,777

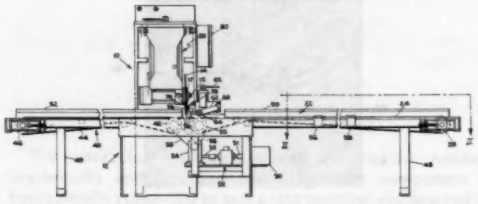
DEFECTING SAW

John R. Davies, Grand Rapids, Mich., assignor to Oliver Machinery Company, Grand Rapids, Mich.

Filed Oct. 6, 1971, Ser. No. 186,897

Int. Cl. B27b 5/02

U.S. Cl. 144—3 N 6 Claims



A defecting saw including a feed conveyor and a transversely movable rotating saw, both of which are controlled by means of a control circuit including a light detector for detecting fluorescent marks placed on a board to identify a defect area. An ultraviolet light source is mounted adjacent the saw blade together with the light detector such that, as a board is fed into the saw blade area by the feed conveyor, the detector will detect light from the illuminated fluorescent mark. The light detector is coupled to the control circuit which operates to stop the feed conveyor and simultaneously swing the rotating saw transversely across the board at the fluorescent mark. After a cut is made, the feed conveyor again starts until the next fluorescent mark is detected. Defects are thereby automatically cut away from the board when they are marked on either side by such fluorescent marks.

3,780,778

SAWING AND CHIPPING MACHINE

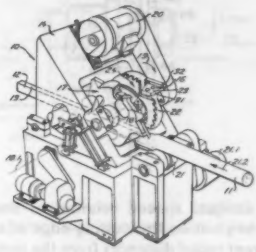
Frederic Frank Chapman, Coquitlam, British Columbia, Canada, assignor to Hawker Siddeley Canada Ltd., Toronto, Ontario, Canada

Filed Mar. 27, 1972, Ser. No. 238,115

Claims priority, application Great Britain, Aug. 14, 1971, 38,232/71

Int. Cl. B27c 1/08; B27l 11/02

U.S. Cl. 144—39 7 Claims



A sawing and chipping machine for providing a sawn face on a log having a rotable head on which a circular saw and chipping knives are mounted for sawing a slab from a moving log and at the same time reducing the slab to chips suitable for pulping.

3,780,779

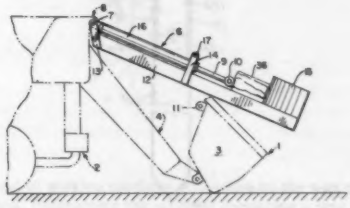
LOG SPLITTING DEVICE ADAPTED TO UTILIZE POWERED PISTON ON TRACTOR

Richard J. Guy, 37 Redington St., Bay Shore, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,544

Int. Cl. B27l 7/00

U.S. Cl. 144—193 A 3 Claims



A hand portable attachment for splitting logs readily attachable to and adapted to cooperatively operate with a powered piston on a tractor or similar equipment. The attachment includes a frame detachably engageable to the equipment, a wedge mounted on the frame adjacent one end of the path of travel of the piston and holding brackets to align and steady the cylinder which carries the piston. Logs are placed between the piston and the wedge and urged against the wedge causing them to split.

3,780,780

ROTARY CUTTING BLADE

David D. Pettigrew, 11300 124th Ave. North, Largo, Fla., and Richard Vaughn, Highway 81-35, Dilley Hotel, Dilley, Tex.

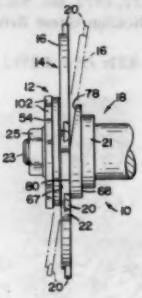
Filed Oct. 2, 1972, Ser. No. 293,839

Int. Cl. B27b 33/00

U.S. Cl. 144—238 13 Claims

An adjustable rotary dado blade assembly of the type designed to be mounted for relatively high speed rotation on an arbor or the like and including mounting means in the form of at least two cam assemblies movably engaging one another and the blade itself so as to position the blade in engagement

with a positioning surface, the configuration of which defines the angular orientation of the plane of the blade relative to the axis of rotation of the blade. The blade means includes a disc having a plurality of cutting elements formed about the



periphery in unequal spaced relation to one another and located so as to position the cutting edge of the cutting elements at different radial distances from the center of the blade disc so as to provide a substantially level dado.

3,780,781

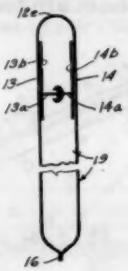
OPENABLE BAG

Tatsuro Uramoto, c/o Seisan Nippon Sha, Ltd. New Kohjimachi Building, 3, 5-chome, Kohjimachi, Chiyoda-ku, Japan

Continuation-in-part of Ser. No. 882,491, Dec. 5, 1969, abandoned. This application Sept. 7, 1971, Ser. No. 178,088

Int. Cl. B65d *17/24, 33/24*

U.S. Cl. 150—3 **12 Claims**



A plastic film structure for forming a bag including a sheet of thin plastic film with continuous shaped interlocking rib and groove profiles thereon either integral with the film or on strips which are fused to the film with the sheet having plastic reinforcing strips thereon between the profiles with the reinforcing strips providing tear guidelines for tearing off the top of a bag formed from the sheet to thereafter provide gripping flanges for separating the profiles and opening the bag.

3,780,782

TIRE WITH BELT BETWEEN BIAS CARCASS PLIES

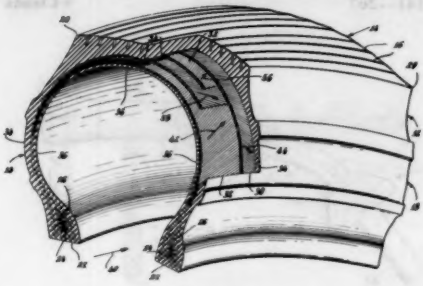
George L. Jennings, Grosse Point Woods, and Parks M. Nichols, Detroit, both of Mich., assignors to Uniroyal Inc., New York, N.Y.

Continuation-in-part of Ser. No. 793,299, Jan. 23, 1969, abandoned. This application Dec. 17, 1970, Ser. No. 99,109

Int. Cl. B60c *9/20*

U.S. Cl. 152—356 **24 Claims**

A bias ply tire incorporates a pair of oppositely oriented non-woven breakers between two successive body plies in the region underlying the crown region of the tread layer. The breakers are inserted prior to shaping and curing. In a four-ply tire, one such pair of breakers preferably is inserted between the first and second, that is, the innermost, body plies, and another such pair of breakers may similarly be inserted between the third and fourth, that is, the outermost, body plies. Also, a third such pair of breakers may be inserted between the second and third body plies if further improved results are desired. The cord directions of each successive



layer, whether a body ply or a breaker, may alternate relative to the longitudinal center line of the tire crown or the cords of successive coacting layers of breaker and body ply may be in the same general direction relative to the longitudinal center line of the tire crown. The result is an improvement in stability, owing to a lower cord angle in the crown region, without any sacrifice of ride softness, owing to a higher cord angle in the sidewall region.

3,780,783

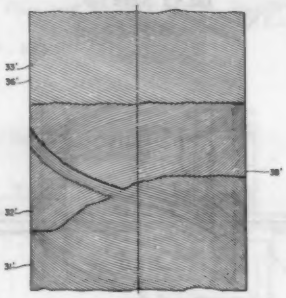
TRIANGULATED CARCASS TIRE

Walter W. Curtiss, Jr., Brimfield, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 31, 1972, Ser. No. 258,109

Int. Cl. B60c *9/10*

U.S. Cl. 152—356 **11 Claims**



A pneumatic tire having three plies of tire cord fabric in which the cords in two of the plies follow a geodesic cord path and the cords in the third ply follow a conventional cord path. The individual cords in all of the plies are of the same length and each ply has its radially inner ends turned about the respective bead core.

3,780,784

EXPANDABLE TIRE RETAINER ASSEMBLY

Carl P. Spier, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

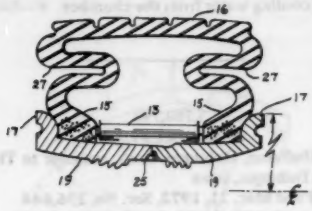
Filed June 7, 1972, Ser. No. 260,646

Int. Cl. B60c *17/00*

U.S. Cl. 157—1 **3 Claims**

A retainer assembly for use with expandable tires wherein a pair of circular metallic bands having a plurality of tabs ex-

tending radially outward therefrom are positioned around the wheel rims such that the tabs are located nearly adjacent the tire beads. A hollow spreader bar is positioned between the bands at each tab location and a headed stud is passed through



the tab inwardly into the spreader bar to maintain the tabs in spread condition which, in turn, holds the tire beads against the tapers or flanges of the wheel rim during the mounting process and would also operate to retain the tire on the wheel if and when an emergency "run-flat" condition existed.

3,780,785

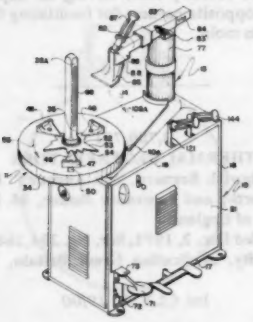
BEAD BREAKER AND TIRE REMOVAL AND REPLACEMENT DEVICE

Matthew Schultz, Box 241, and William L. Schultz, Box 485, both of Red Lake Falls, Minn.

Filed Sept. 27, 1971, Ser. No. 184,101

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.24 **34 Claims**



The wheel and tire are mounted for selective rotation horizontally and an upper bead breaking component is hydraulically controlled to swing into position and descend to break the top bead. A lower plate type bead breaker is hydraulically actuated to move upwardly to move the lower bead. The table is then rotated and a tire removal tool engaged upon the central standard for removing the tire from the rim. The same tool is reversed to install the tire on the rim.

3,780,786

DIRECT CONTACT EVAPORATORS

Pierre Henri Pacault, Ville d'Avray, and Marc Kagans, Asnieres, both of France, assignors to The Babcock & Wilcox Company, New York, N.Y.

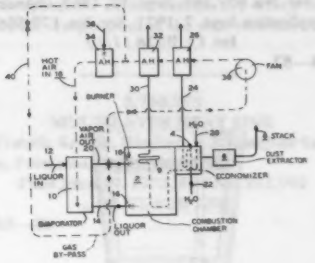
Filed Jan. 21, 1971, Ser. No. 108,353

Claims priority, application France, Jan. 29, 1970, 7002059

Int. Cl. B01d *1/16*

U.S. Cl. 159—4 A **3 Claims**

A direct contact evaporator for concentrating residual pulp liquor where the concentration of the liquor is accomplished by hot air. The combustion of the concentrated liquor in a boiler produces hot gases which are used to produce steam and to preheat the feed water with steam and hot water utilized in indirect heat exchangers to heat the air used in concentrating the liquor. Additional heat is applied to the air as generated by separate fuel combustion in a separate indirect air heater.



3,780,787

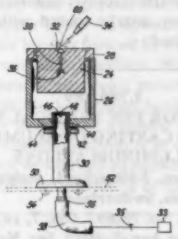
METHOD OF VACUUM INVESTMENT CASTING

Jens Ejnar Rasmussen, Langgade 3, Randers, Denmark

Filed June 17, 1971, Ser. No. 154,000

Int. Cl. B22c *9/02*; B22d *27/16*

U.S. Cl. 164—35 **6 Claims**



A method of making castings according to the wax elimination method, comprising the steps of mounting a wax pattern on a holding pin member, placing the pattern in a substantially centered position in a cuvette with said holding pin extending upwardly therefrom, pouring into said cuvette an investment slurry of a type setting into an air permeable, rigid, heat resistant block, allowing said slurry to set, causing said pattern and said holding pin to disappear from the mould block thus produced, placing said mould block in an opening in a vacuum chamber in such a manner that the hole left by said holding pin communicates with the atmosphere outside said vacuum chamber whilst a substantial portion of the remaining block surface is situated inside the chamber sealed off from the said atmosphere, filling liquid casting material into said hole in the mould block and subjecting said vacuum chamber to vacuum so as to cause said casting material to be sucked into the cavity left by said pattern, allowing the casting material to solidify and removing the mould block from the vacuum chamber, breaking the mould block in order to release the casting therefrom, and separating the part of the casting corresponding to said pattern from the part corresponding to the passage left by said holding pin, characterised by providing the top portion of said mould block with a radially protruding, annular flange prior to its introduction into the vacuum chamber and by inserting the mould block into the vacuum chamber opening so as to bring the said flange into sealing engagement with the edge of the opening by the movement thereagainst.

3,780,788

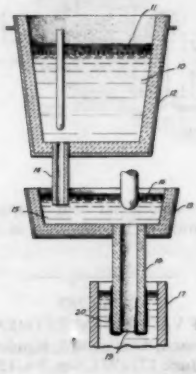
METHOD FOR CONTINUOUSLY CASTING STEEL USING A PARTIALLY COATED REFACTORY NOZZLE

George J. Sundy, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 857,566, Sept. 12, 1969, abandoned. This application Sept. 7, 1971, Ser. No. 178,506

Int. Cl. B22d 11/10

U.S. Cl. 164—82 9 Claims



A method for continuously casting steel in which a refractory nozzle extending downwardly into the molten metal in the mold is coated with a carbonaceous material, for example coal tar pitch. A refractory nozzle coated with a carbonaceous material is also described.

3,780,789

APPARATUS FOR THE VERTICAL MULTIPLE CONTINUOUS CASTING OF ALUMINUM AND ALUMINUM ALLOYS

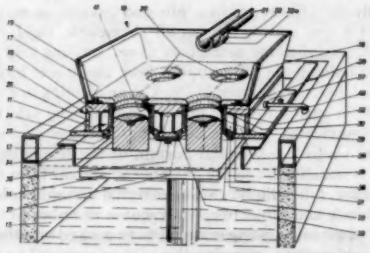
Manfred Unger, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 78,687, Oct. 7, 1970, abandoned. This application Aug. 2, 1972, Ser. No. 277,263

Claims priority, application Switzerland, Oct. 8, 1969, 15043/69

Int. Cl. B22d 11/12

U.S. Cl. 164—283 R 2 Claims



Apparatus for the vertical multiple continuous casting of aluminum and aluminum alloys comprising a distributing launder for the casting metal, a plurality of water-cooled continuous casting molds, a common lowering platform movably arranged in a pit and carrying the starting dummies of all the molds in a common fashion, the molds are disposed in a fluid-tight manner in a common cooling box, the distributing launder including openings which approximately match the cross section of the molds which are disposed below the level of the openings, a jacket surrounding each mold and forms with the exterior side of the associated molds a chamber for the cooling water and has apertures in its upper part for the inlet of the cooling water from the common cooling water box, the jacket also having further apertures in its lower part for the outlet of the cooling water from the chamber.

3,780,790

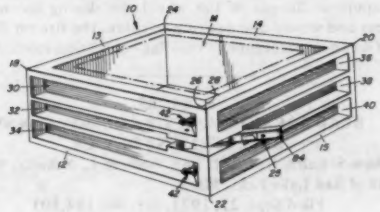
FOUNDRY FLASK

Thomas C. Hoffman, Dubuque, Iowa, assignor to The Adams Company, Dubuque, Iowa

Filed Mar. 21, 1972, Ser. No. 236,644

Int. Cl. B22c 21/00, 21/02, 21/10, 21/08

U.S. Cl. 164—392 8 Claims



A break-open foundry flask having an adjustable toggle mechanism on opposite corners for facilitating the removal of the flask from its mold.

3,780,791

THERMAL REGENERATORS

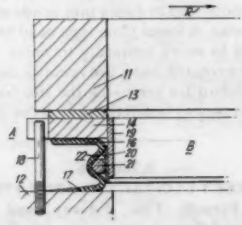
Mark Cary Sedgwick Barnard, "St. Andrews" Upper Ladyes Hill, Kenilworth, and Lawrence Butler, 16 Henley Cres., Solihull, both of England

Filed Dec. 2, 1971, Ser. No. 204,168

Claims priority, application Great Britain, Dec. 4, 1970, 57861/70

Int. Cl. F28d 19/00

U.S. Cl. 165—9 3 Claims



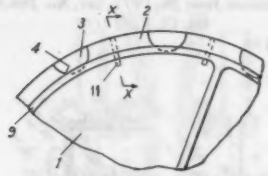
In a thermal regenerator for a gas turbine a matrix is rotatably mounted in a housing. To segregate high and low pressure gas flows through the matrix a sealing assembly is provided in which a pad seal is urged into contact with the matrix and the space between seal and housing is closed by an elastomeric curtain.

3,780,792

THERMAL REGENERATORS

James Alexander Ritchie, 22 Lundy View, Chelmsley Wood, Birmingham, England

Filed Mar. 22, 1972, Ser. No. 236,946
Int. Cl. F28d 19/00
U.S. Cl. 165—9 5 Claims



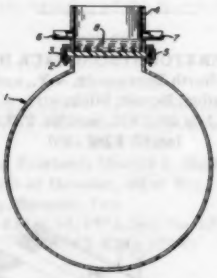
A microcellular ceramic thermal regenerator disc, for use in a gas turbine engine, has a slot formed in its periphery between adjacent pairs of drive pins, each slot having both its ends terminating short of the two end faces of the disc.

3,780,793

HIGH SERVICE TEMPERATURE PRESSURE SENSITIVE DEVICE

William J. Didycz, Whitehall Borough, and Almon D. Seabury, Hampton Twp., Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 14, 1971, Ser. No. 133,938
Int. Cl. F24h 13/00
U.S. Cl. 165—47 8 Claims



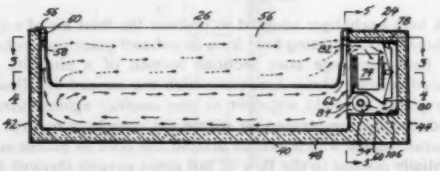
Rupture discs are combined with cooling means to provide high service temperature pressure sensitive devices.

3,780,794

FOOD TABLE

Bernard Staub, 522 Thrush Dr., Dresher, Pa.

Filed Dec. 2, 1971, Ser. No. 203,960
Int. Cl. F25b 29/00
U.S. Cl. 165—58 15 Claims



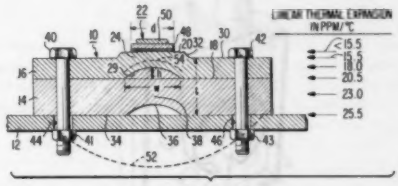
A food dispensing and storage device comprising a housing and a food dispensing pan positioned in the top of the housing. The housing includes a fan and a heat transfer means therein. The fan circulates air across the heat transfer means, under and around the food dispensing pan and back to the circulating fan. Thus, the air is completely circulated and re-circulated around the pan. A temperature sensing element measures the temperature of the return air, which temperature also reflects the temperature of the pan, and therefore its contents.

3,780,795

MULTILAYER HEAT SINK

Anthony Francis Arnold, Ringoes, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed June 19, 1972, Ser. No. 263,992
Int. Cl. F28f 7/00
U.S. Cl. 165—80 18 Claims



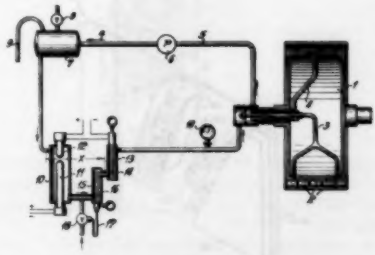
An improved heat sink comprises an integral metallic structure, having upper and lower layers of different metals, respectively, fixed to each other to provide a common interface. The lower layer has a greater coefficient of thermal expansion than the upper layer. An upwardly extending dimpled portion of the upper layer is formed by a dent that extends upwardly from the common interface. When the heat sink is heated by a heat-producing device mounted on the surface of the dimpled portion, the lower layer tends to expand in an opposite direction to that of the dimpled portion of the upper layer, so that the dimpled portion is in compression, thereby limiting the amount of thermal expansion and distortion that would normally occur at the surface of the dimpled portion.

3,780,796

MULTICOLOUR PRINTING PRESS COMPRISING A BACKING CYLINDER CONTAINING HEATING CHAMBERS

Horst Miram, and Karl Heinz Schner, both of Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Nov. 12, 1971, Ser. No. 198,315
Claims priority, application Germany, Nov. 12, 1970, P 20 55 584.4
Int. Cl. B60h 1/00
U.S. Cl. 165—39 5 Claims



In a multi-colour printing press comprising a backing cylinder containing heating chambers traversed by a medium

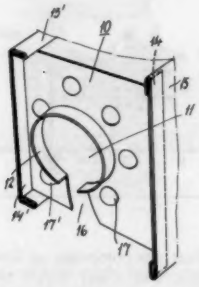
which is heated in a flow circuit, the said circuit including a heater and a thermostat downstream of the heater for controlling the heater, overheating of the backing cylinder arising out of hunting in the control effected by the thermostat is minimised by a temperature regulator which is effective to introduce a controlled amount of cold medium in the flow path between the heater and the thermostat whenever the temperature of the heating medium exceeds a predetermined value.

3,780,797

CONVECTORS

Sven Runo Vilhelm Gebelius, Fridhemsgatan 27, Stockholm, Sweden

Filed Feb. 28, 1972, Ser. No. 229,655
Int. Cl. F14f *1/30*
U.S. Cl. 165—55 **3 Claims**



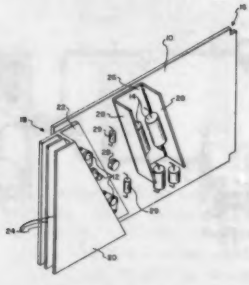
A heat exchange assembly and method of producing the same comprising a series of dished fin members disposed in spaced relationship between to opposite, longitudinally extending side members, each of the fin members being recessed for seating a pipe in which a heat exchange fluid is circulated and having a slot terminating in the recess to provide an entry passage for the pipe, the marginal edge portions of the slot being adapted to be twisted, bent or otherwise distorted by the forced insertion of the assembly over the pipe; the convex side of the dished fin members each having a collar projecting laterally about the recesses in a diverging direction from the convex side which collars clamp the fins about the pipe when the dished fin members are flexed or buckled towards their opposite convex position.

3,780,798

AIR DIRECTING HEAT SINK MOUNTING OF ELECTRICAL COMPONENTS

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 30, 1972, Ser. No. 301,903
Int. Cl. H02b *1/00*
U.S. Cl. 165—128 **4 Claims**



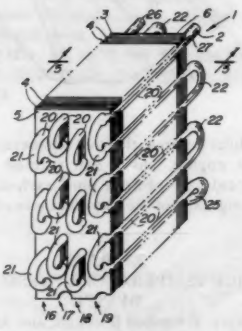
Electronic component mounting heat sink members for printed wiring cards have heat dissipating fins oriented with respect to the free convection air flow such as to direct heated air out of the equipment in which the components are used.

3,780,799

HEAT EXCHANGERS AND METHOD OF MAKING SAME

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Continuation of Ser. No. 85,958, Nov. 2, 1970. This application June 26, 1972, Ser. No. 266,501
Int. Cl. F28f *1/30*
U.S. Cl. 165—150 **19 Claims**



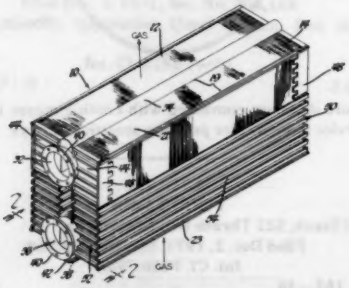
Heat exchangers of the combination plate-fin and side-entry cross-fin type embodying a one-piece cross-fin and a serpentine, one-piece tubular member with return bends disposed at opposite sides of the fins, and method of making the same.

3,780,800

REGENERATOR STRONGBACK DESIGN

Robert J. Flower, North Tonawanda, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed July 20, 1972, Ser. No. 273,444
Int. Cl. F28f *3/00*
U.S. Cl. 165—166 **3 Claims**



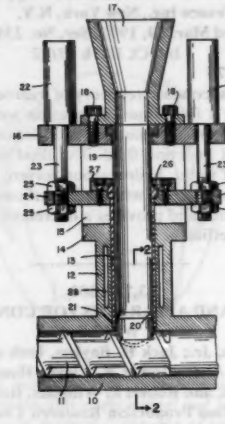
A heat exchanger adapted to preheat the inlet air of a gas turbine by transmitting heat from its exhaust gases and including heat exchange core sections formed of a plurality of spaced parallel plates between which the air and gas flows. The plates are held adjacent to one another against forces produced by compressed air within the core by a number of separate bands which extend around the core in planes substantially normal to the flow of hot gases passing through the core. The separate bands around the core permit it to expand without being greatly restrained by a less expansive or cooler single member around the core.

3,780,801

MATERIAL FEEDING APPARATUS

Edgar W. Irving, Jr., Somerville, N.J., assignor to Egan Machinery Company, Somerville, N.J.

Filed Jan. 29, 1973, Ser. No. 327,641
Int. Cl. F28f 5/06
U.S. Cl. 165—120 5 Claims



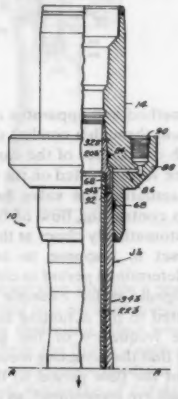
Feeding apparatus, especially for plastics extruders, for particulate materials which are difficult or impossible to feed with known feeders due to the materials being tacky and heat sensitive. A reciprocating sleeve in the feed inlet to the extruder provides a means of breaking up agglomerates of materials and preventing the bridging of the feed inlet caused by such agglomeration.

3,780,802

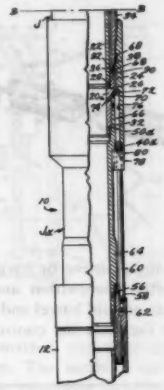
CONCENTRIC TUBING HYDRAULIC POWER UNIT, PARTICULARLY FOR DOWN-HOLE SAFETY VALVE ACTUATION

Willis M. Phipps, Pearland; Marvin L. Holbert, Jr., and John K. McGee, both of Houston, all of Tex., assignors to Gray Tool Company, Houston, Tex.

Filed May 10, 1972, Ser. No. 252,101
Int. Cl. E21b 17/00
U.S. Cl. 166—89 4 Claims



Concentric tubing is supplied with fittings and seals to define an annulus about the inner tubing through which hydraulic fluid may be selectively pressurized to operate a down-hole tubing safety valve. This construction permits the unit to be rotated without fouling the control means for the valve, permits the unit to be raised and lowered through a stuffing box-type tubing hanger and to be used in single or multiple completions.

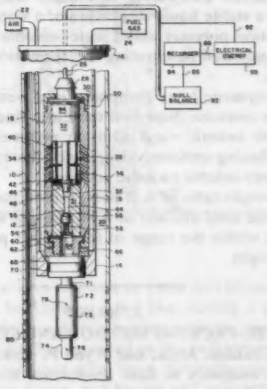


3,780,803

DOWNHOLE CONTROL VALVE FOR CATALYTIC WELLBORE HEATERS

William C. Hardy, Richardson, and Henry P. Lichte, Jr., Houston, both of Tex., assignors to Sun Oil Company, Dallas, Tex.

Filed May 17, 1971, Ser. No. 144,175
Int. Cl. E21b 43/24
U.S. Cl. 166—59 23 Claims



A downhole control valve is positioned in well pipe above a catalytic wellbore heater and is used to control fuel being fed to the heater.

3,780,804

CABLE MOUNTED BAILER FOR WELL DRILLING AND CLEANING

Vernon E. Pagel, 1332 E. Orangewood, Phoenix, Ariz.

Filed Oct. 10, 1972, Ser. No. 296,067
Int. Cl. E21b *27/00, 33/132*
U.S. Cl. 166—162 **6 Claims**

A well bailer having a sleeve or barrel with a valve head reciprocably supported therewithin and a cooperative arrangement of notches on said barrel and a barrel holder to fit into said notches to facilitate the controlled dumping of the bailer.

3,780,805

VISCOUS OIL RECOVERY SYSTEM

William G. Green, 10614 Hempstead Rd., Houston, Tex.

Filed Sept. 7, 1971, Ser. No. 178,287
Int. Cl. E21b *43/22, 43/27*
U.S. Cl. 166—266 **8 Claims**

A system to provide means for recovering crude oils known to exist in production formations which cannot be produced economically by systems now in operation and known to the industry. This type of oil will not flow into the wells drilled to produce it because it is too viscous, and has no mobility.

3,780,806

INVERTED MIXED LATEX FOR WATER FLOODING

Lawrence L. Bott, Oak Park, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 222,302
Int. Cl. E21b *43/16*
U.S. Cl. 166—275 **7 Claims**

An improved water flooding process for recovering oil from a subterranean oil-bearing formation which comprises introducing a stable liquid dispersion of a water-soluble anionic vinyl addition polymer and a water-soluble cationic polymer into an input well penetrating the formation. The dispersion comprises:

A. A polymeric latex composed of a water-in-oil emulsion which contains dispersed therein a finely divided water-soluble anionic vinyl addition polymer, said polymeric latex having uniformly distributed therethroughout; and

B. A water-soluble cationic polymer;

with the weight ratio of A:B being within the range of 1:10 to 10:1 and the total amount of A+B present within said dispersion being within the range of from 0.001 percent to 75 percent by weight.

3,780,807

GRAVEL-PACKING METHOD AND COMPOSITION

John W. Graham, Alvin, and Wynn P. Rickey, Houston, both of Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Sept. 13, 1972, Ser. No. 288,859
Int. Cl. E21b *43/04*
U.S. Cl. 166—278 **12 Claims**

A well is gravel packed by injecting a fluid suspension of coarse particles having fine grains of sand or similar material bonded to their outer surfaces. The composite particles thus employed readily bridge together to form a bed which is capable of withstanding relatively high differential pressures.

3,780,808

SECONDARY RECOVERY METHOD

Charles A. Christopher, Houston; Joseph C. Allen, Bellaire, both of Tex., and Jack H. Kolaian, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,388
Int. Cl. E21b *43/22*
U.S. Cl. 166—275 **10 Claims**

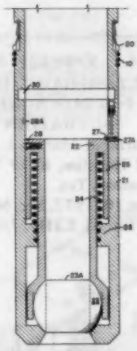
A method of secondary recovery of hydrocarbons which involves injecting a fluid into an injection well and producing hydrocarbons from a production well involves the use of a novel thickened injection fluid. The fluid comprises an intimate mixture of water, hydrocarbon solvent and colloidal silica. The fluid is miscible with hydrocarbons in the reservoir and aqueous fluids and provides a decreased mobility ratio to enhance sweep efficiency.

3,780,809

METHOD AND APPARATUS FOR CONTROLLING WELLS

Robert C. Ayers, Jr.; Jack H. Bayless, both of Houston; John W. Graham, Alvin; James R. Lloyd, Houston; William D. Loth, Houston, and Robert E. Williams, Houston, all of Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Apr. 12, 1972, Ser. No. 243,360
Int. Cl. E21b *43/00*
U.S. Cl. 166—314 **17 Claims**



An improved method and apparatus are disclosed for controlling flow of fluid through a conduit disposed within a well extending beneath the surface of the earth. The apparatus includes a subsurface valve situated on the conduit and provided with means for actuating the valve between an open and closed position to control the flow of fluid through the conduit. The valve automatically closes at the end of a preset flow period unless reset in response to an external signal to reinitiate the predetermined period to closure. Normally a surface generated signal, as for example a pressure pulse, is periodically directed to the actuating means to reinitiate the flow period. The frequency of the pulses is adjusted as required to assure that the actuating means will receive a pulse prior to the end of the flow period so flow will not be interrupted. If the pulses are interrupted, as for example by a rupture in the well conduit, the valve will close automatically at the end of the flow period.

3,780,810
HORSESHOES

John Congreve Ashton, Sheffield, England, assignor to Benjamin Baker (Lye) Limited, Stourbridge, Worcestershire, England

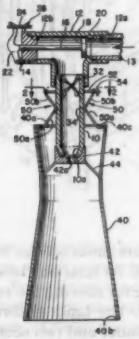
Filed Aug. 2, 1972, Ser. No. 277,417
Claims priority, application Great Britain, Aug. 9, 1971, 37313/71
Int. Cl. A01l *1/00*
U.S. Cl. 168—4 14 Claims

Horseshoe and method of manufacture which comprises casting of metal, preferably carbon steel and annealing. A horseshoe made by such method is capable of having any one or combination of features which are expensive, difficult or impossible to produce utilising conventional horseshoe manufacturing techniques.

3,780,811
METHOD OF FIRE PROTECTION USING RECIRCULATION OF COMBUSTION PRODUCTS

Cheng Yao, Weston, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Division of Ser. No. 198,386, Nov. 12, 1971, Pat. No. 3,708,015. This application Aug. 3, 1972, Ser. No. 277,495
Int. Cl. A62c *35/00*
U.S. Cl. 169—12 10 Claims

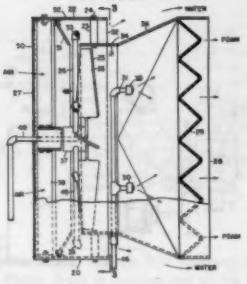


A method for fire protection wherein a nozzle discharges an extinguishant in response to a predetermined fire condition in a manner to create an aspiration effect which circulates the combustion products from the fire in a path including the fire. The circulation of the combustion products is terminated and the rate and manner of discharge of extinguishant from the nozzles can be changed in response to an additional predetermined fire condition.

3,780,812
METHOD AND APPARATUS FOR GENERATING FIRE-FIGHTING FOAM

Milton Lambert, 6236 Ellwell Cres., Rego Park, N.Y.

Filed July 6, 1971, Ser. No. 159,950
Int. Cl. A62c *5/02*
U.S. Cl. 169—15 7 Claims

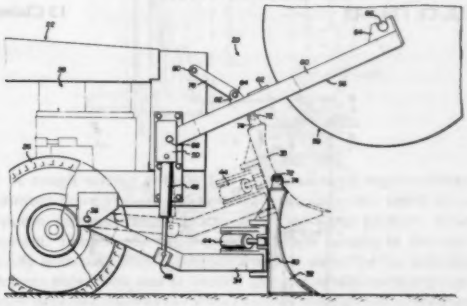


A fire protection method and apparatus for generating a high expansion foam. The method includes fluidizing the foams by wetting. The apparatus includes a housing having a source of foam solution under pressure and a source of water under pressure. The housing includes a fan and a perforated member. The fan is positioned in the housing to provide air flow across the perforated member which is wetted by the foam solution to produce high expansion foam bubbles. The fan is driven by a plurality of nozzles mounted both for discharging the water under pressure and for wetting the foam bubbles.

3,780,813
REEL LIFT AND SUPPORT FOR BULLDOZER

Charles J. Davis, and Billy M. Glass, both of Wichita, Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 24, 1972, Ser. No. 237,784
Int. Cl. A01b *49/00*; E02f *3/76*
U.S. Cl. 172—438 7 Claims

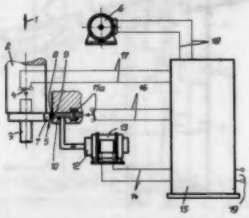


This disclosure relates to a wire or cable reel lift and support mechanism for a bulldozer, or the like, having a power lift dozer blade. The improved mechanism includes an H-shaped frame, which is pivotally supported on the bulldozer above the dozer blade, and a pair of drop links, pivotally connected to the dozer above the frame, and having end connectors which retain the frame in a generally upright position. A cable or wire reel is supported for rotation in yokes on the frame and the reel is raised and secured by lifting the dozer blade and securing the links to the frame. The frame and reel are then independent of the dozer blade.

3,780,814
SETTING DEVICE FOR THE STROKE POSITION OF A RECIPROCATING TOOL

Eugen Herb, Ditzingen, Germany, assignor to Firma Trumpf & Co., Ditzingen, Germany

Filed July 11, 1972, Ser. No. 270,713
Claims priority, application Germany, Aug. 19, 1971, P 21 41 521.4
Int. Cl. B26d 7/26
U.S. Cl. 173—2 18 Claims

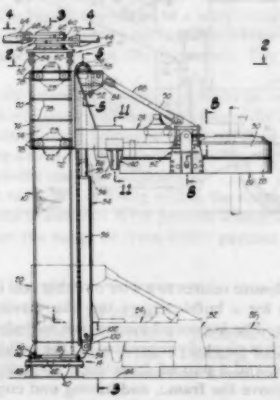


A reciprocating tool, such as a stamping or nibbling die, has an adjustment which is driven by an electric motor. An electromechanical, photoelectric, or air pressure checking device checks the stroke position of the tool and controls operation of the motor driving the adjustment. The checking device becomes operative automatically responsive to insertion of a new tool into a tool holder and, responsive to deviation of the stroke position from a nominal or preset value, controls the motor to operate the adjustment in a direction to restore the stroke position to the nominal value. When the stroke position attains the nominal value, the supply of energy to the motor, to the checking device, or to both is automatically interrupted.

3,780,815
POWER TONG POSITIONING APPARATUS

Charles Dwain Barron, Huntington; Bela Geczy, Glendale, and Carl Alfred Wilms, La Habra, all of Calif., assignors to Byron Jackson, Inc., Long Beach, Calif.

Filed Jan. 7, 1972, Ser. No. 216,216
Int. Cl. E21b 19/16
U.S. Cl. 173—43 13 Claims

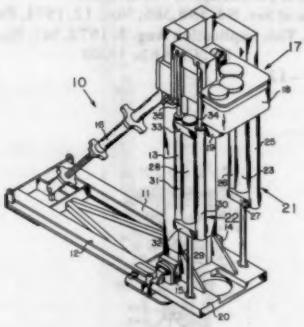


Well pipe positioning apparatus having a vertically disposed column formed of a central web joined between two parallel flanges and provided with bearing units adapted to be mounted in a well derrick to permit vertical and horizontal support for the column while permitting the column to pivot horizontally. A vertically movable rectangular hollow support collar is fitted about the column and supported in alignment for movement up and down the column by roller means rigidly mounted within the collar and mounted in rolling contact with the inside faces of the column flanges. A pipe tong support yoke structure is rigidly mounted at a first end to the support collar to extend horizontally and radially from the pivotable column. The yoke structure is adapted to receive and support a power tong assembly including a pipe back-up unit disposed in parallel relation to a pipe rotating unit through a supporting cradle means mounted to the second end of the yoke structure. The cradle means provides firm vertical support of the back-up unit in parallel relation to the yoke structure and provides support with limited vertical and radial movement of the rotating unit with respect to the back-up unit and to the support yoke. A power source providing linear movement is mounted in upright position adjacent the column with its lower end mounted to the lower support member and its upper end connected through a flexible force transfer means to the support yoke, the flexible force transfer means being anchored relatively between the yoke structure and the lower support member and being connected across a force transfer crosshead means mounted to the upper end of the power source.

3,780,816
EARTH BORING MACHINE WITH TANDEM THRUST CYLINDERS

Thomas L. Arrington, and Norman D. Dyer, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 14, 1972, Ser. No. 234,528
Int. Cl. E21c 5/11
U.S. Cl. 173—152 7 Claims

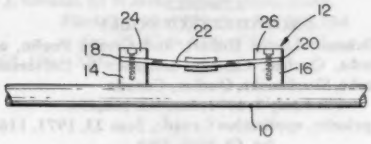


Rotary drilling means are mounted for travel along the support frames of a raise drill. At least one tandem thrust cylinder system provides the force for moving the rotary drilling means along the support frame. The tandem thrust cylinder system includes a first thrust cylinder and two second thrust cylinders mounted so that the thrust force and movement of said first thrust cylinder is directly opposed to the thrust forces and movements of said two second thrust cylinders. The combined cross sectional area of said two second thrust cylinders is substantially equal to the cross sectional area of said first thrust cylinder thereby maintaining constant force throughout the stroke of the tandem thrust cylinder system. The cylinders are manifolded so that fluid enters one port and is routed to all of the cylinders to equalize the rate of travel and the forces exerted.

3,780,817
WEIGHING DEVICES

John A. Videon, 1336 S.E. 38th Pl., Gainesville, Fla.

Filed Feb. 28, 1969, Ser. No. 803,285
Int. Cl. G01g 19/08, 3/14, 23/26
U.S. Cl. 177—136 5 Claims

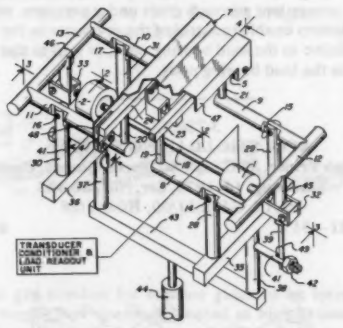


This invention is directed to a load-indicating apparatus for measuring the deflection of a relatively stiff non-spring member. The apparatus includes a non-spring member such as the stationary axle of a truck which is capable of flexing in a predetermined direction under load. Mounted on the axle are two spaced-apart, rigid supports which upstand therefrom in a direction whereby the upper ends of the supports will move toward and away from each other as the axle flexes. A transducer is connected to the upper ends of the supports for measuring the distance therebetween as they move and to provide an indication of the load on the axle.

3,780,818
FORCE TRANSMITTING APPARATUS WITH A SINGLE LOAD CELL

Donovan H. Lumby, Minneapolis, and Walter F. Sofie, St. Paul, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed June 19, 1972, Ser. No. 264,083
Int. Cl. G01g 21/08
U.S. Cl. 177—256 9 Claims

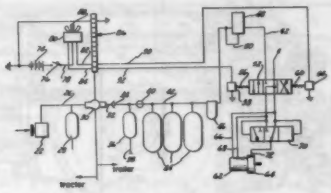


A force transmitting apparatus that has a generally horizontal weighing platform which transmits the weight of an object to a single load cell. Two similar spaced rigid frame structures connected to the platform by several tension members act as part of the mechanism of force transmission. The load cell itself is supported by a rigid member between two pivotal connections that may be constructed by a groove and knife edge. An overload device may also be employed on the same rigid member to prevent the cell from being subjected to loads above its upper rating. Additional pivotal mountings are used to join the rigid frame members to a supporting rigid frame structure that may be divided into two assemblies or may be one unitary assembly. A pump powered hydraulic cylinder may be used to raise the total structure with its platform and a readout unit may be used to record the force generated by an object on the platform.

3,780,819
LAND VEHICLE

John E. Coordes, Birmingham, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 13, 1971, Ser. No. 180,018
Int. Cl. B62d 59/04
U.S. Cl. 180—14 A 4 Claims

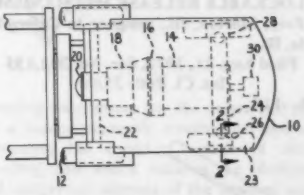


A tractor-semi-trailer vehicle has a power assist trailer axle in which the trailer axle is connected to be driven by an air motor driving the trailer differential through a clutch. The power assist motor and the clutch receive air from storage tanks on the trailer through a solenoid-operated control valve and a shuttle valve. An operator-operable switch controls the solenoid-operated valve. The tractor rear axle has a roll capability relative to the tractor front axle; since the tractor rear axle defines the attitudinal plane of the semi-trailer axle, the total vehicle can traverse very uneven terrain without lifting a wheel off the ground.

3,780,820
HYDROSTATIC AUXILIARY WHEEL MOTOR ASSIST DRIVE SYSTEM FOR VEHICLES

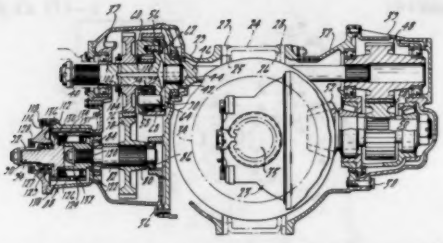
Delmar G. Schwab, and Dennis P. Graham, both of Milwaukie, Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Apr. 23, 1971, Ser. No. 136,741
Int. Cl. B60k 17/34
U.S. Cl. 180—44 M 27 Claims



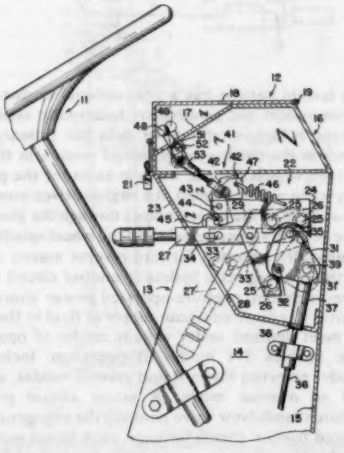
A rough terrain vehicle has a conventional engine-driven primary drive system and an auxiliary hydrostatic assist drive system having a higher ratio drive than the primary drive system. Thus in the assist system, wheel motors in the normally undriven wheels provide traction assist for the primary drivers only when and as needed. An engine-driven pump supplies pressure fluid to the wheel motors through the pivot joint between the vehicle's steering axle and the wheel spindle trunnions. A manually operated forward-reverse master control valve selectively energizes a hydraulic control circuit for the assist system including pressure-operated power control and shorting valves to ensure adequate supply of fluid to the wheel motors to meet demand under various modes of operation. The circuit enables five modes of operation, including a neutral mode, powered forward and reverse modes, a retard mode and an overrun mode. A motor circuit pressure-operated clutch modulator valve controls the engagement of a fluid activated friction clutch between each wheel motor and its driven wheel in a manner so that the clutch is variably engaged or disengaged automatically as dictated by the need for traction assist.

3,780,821
VEHICLE DRIVE SYSTEM
James M. Prange, Dearborn Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Aug. 11, 1971, Ser. No. 170,690
Int. Cl. B60k 17/34
U.S. Cl. 180—44 R 1 Claim



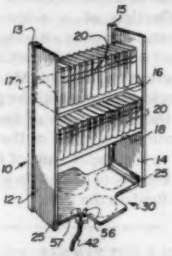
In a vehicle having spaced apart front and rear drive axle assemblies, a power plant and improved power train interconnecting the power plant with the front and rear drive axle assemblies and in which the improved power train includes a torque proportioning gear arrangement dividing torque between the front and rear drive axle assemblies, a first torque transmitting drive train interconnecting the torque proportioning gear arrangement and the power plant, a second torque transmitting drive train interconnecting the torque proportioning gear arrangement and the rear drive axle assembly, and a third torque transmitting drive train interconnecting the torque proportioning gear arrangement with the front drive axle assembly. The third torque transmitting drive train includes a clutch automatically operable to allow differential movement between the front and rear axle assemblies only upon the torque being transmitted by the third torque transmitting drive train reaching a predetermined magnitude.

3,780,822
VEHICULAR PARKING BRAKE CONTROL WITH LOCKABLE RELEASE MECHANISM
Dennis W. Frey, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Aug. 21, 1972, Ser. No. 282,135
Int. Cl. B60r 25/08
U.S. Cl. 180—114 2 Claims



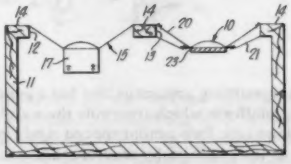
A vehicular parking brake control and lockable release mechanism to permit securing of a parking brake control lever in an engaged position, including a locking member arranged within a structural enclosure for engagement with the brake lever in its engaged position and a control element for moving the locking member into and out of engagement with the brake lever, the control element being disposed on a in compartment.

3,780,823
GROUND EFFECT DOLLY
Treffle Michaud; Lucien Hubert, and Gerard Poulin, all of Sherbrooke, Quebec, Canada, assignors to Universite de Sherbrooke, Sherbrooke, Quebec, Canada
Filed July 7, 1971, Ser. No. 160,494
Claims priority, application Canada, June 23, 1971, 116498
Int. Cl. B60v 1/00
U.S. Cl. 180—121 10 Claims



A ground effect dolly for moving library type bookstacks from one place on the floor to another and which can be operated by only one person if necessary. The dolly is formed of a rigid frame which is adapted to support the lower end portions of the vertical posts of a bookstack, and two sets of gas inflatable pads or cushions mounted to the undersurface of the platform. One set of pads serves to bear the major portion of the load, the other pads are used primarily for maintaining the load in an upright position during displacement. The pads are fed with a convenient gas such as air under pressure, and a distribution system enables control of the pressures in the auxiliary pads relative to the load bearing ones, as well as the relative pressures in the load bearing pads.

3,780,824
ACOUSTIC LOADING SYSTEM
Gilles Joseph Prince, 39 Goupil St., Sorel, Quebec, Canada
Filed Aug. 14, 1972, Ser. No. 280,403
Int. Cl. G10k 13/00; H04r 1/28
U.S. Cl. 181—31 B 4 Claims



A loudspeaker system comprising an enclosure having at least one active radiator and at least one passive radiator mounted in respective openings in the enclosure. The passive radiator has a diaphragm supported by a highly compliant suspension. A mass is coaxially distributed and attached to the passive diaphragm. The mass is chosen so that the movement of the passive radiator will be substantially in phase with the movement of the active radiator within the frequency range of between approximately 20 Hz – 100 Hz. This mass is sufficient to reduce the natural resonance frequency of the loudspeaker

system to a frequency substantially lower than its natural resonance frequency without the added mass attached to the passive diaphragm.

3,780,825

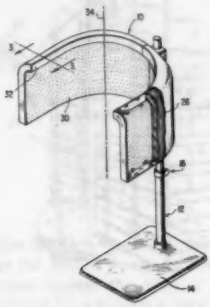
METHOD AND APPARATUS FOR ACOUSTICAL SHIELDING

Fred J. Rinaldi, 63 Wakelee Rd., Wolcott, Conn.

Filed Oct. 18, 1972, Ser. No. 298,794

Int. Cl. E04b *1/99*; **G10k** *11/04*

U.S. Cl. 181—33 G **5 Claims**



An open ended, generally U-shaped acoustical shield adapted for positionment with one open end thereof adjacent the body supporting surface of a bed to position the upstanding U-shaped shield in spaced, surrounding relation to the top and sides of the head of a recumbent.

3,780,826

GAS SILENCING STRUCTURE

Franklin R. Hubbell, III, Brooklyn, N.Y., assignor to Tenneco Inc., Racine, Wis.

Filed Aug. 9, 1972, Ser. No. 279,245

Int. Cl. F01n *3/06*

U.S. Cl. 181—36 B **1 Claim**

An air gap conduit for exhaust gases of an internal combustion engine has openings located at high pressure points which connect the gas flow passage to the space between inner and outer layers of the pipe.

3,780,827

GAS TURBINE EXHAUST NOZZLE

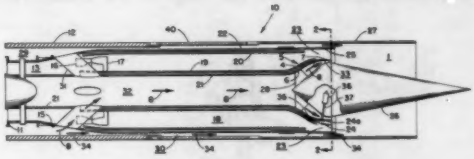
David M. Straight, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 19, 1972, Ser. No. 316,618

Int. Cl. F01n

U.S. Cl. 181—43 **14 Claims**

An elongated hollow string is disposed in an exhaust nozzle combustion chamber and communicates with a source of air through hollow struts at one end. The other end of the string is bell-mouth shaped and extends over the front portion of a nozzle plug. The bell-mouth may be formed by pivotally mounted flaps or leaves which are used to vary the exhaust throat area and the area between the plug and the leaves. Air from the engine inlet flows into the sting and also between the combustion chamber and a housing disposed around the chamber. The sting air cools the plug and serves as a low velocity inner core



of secondary gas to provide noise reduction for the primary exhaust gas while the other air, when it exits from the nozzle, forms an outer low velocity layer to further reduce noise. The structure produces increased thrust in a turbojet or turbofan engine.

3,780,828

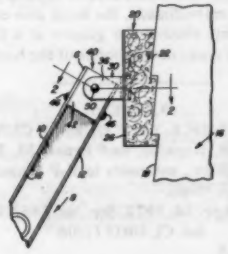
ANTI-SLIP LADDER ATTACHMENT

James E. Overturf, Newton, Iowa, assignor to William C. Ferguson, Newton, Iowa; a part interest

Filed June 16, 1972, Ser. No. 263,656

Int. Cl. E06c *7/48*, *5/36*

U.S. Cl. 182—111 **10 Claims**



A safeguarding attachment for the upper end portion of a side rail of a ladder expressly constructed and adapted to minimize marring the exterior surface of aluminum or equivalent siding and which reduces the likelihood of accidental and dangeroud slipping of the inclined upper end of the ladder. The attachment is characterized, broadly stated, by a compressibly resilient pad having a forward surface adapted to reside against the siding-covered wall surface and a rearward side or surface provided with a rigid backing plate. A bracket has one end secured to the backing plate. An adapter is pivotally connectible to the desired ladder rail. An adjacent end of the bracket is pivotally connected to the adapter. Attachment means functions to operatively secure the adapter to the side rail. In addition connecting means functions to pivotally anchor the adapter on the ladder rail.

3,780,829

LADDER FOR EVACUATING PERSONS FROM CHAIR AERIAL CABLE LIFTS

Otto H. Wallingford, Auburn, Maine, assignor to Valley Engineering, Inc., Gray, Maine

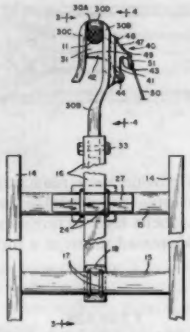
Filed Oct. 26, 1972, Ser. No. 301,055

Int. Cl. E06c *1/36*, *7/48*

U.S. Cl. 182—206 **9 Claims**

A ladder for evacuating persons from chair aerial cable lifts comprising, a rigid ladder, an elongate hook support member,

means for securing the lower end of the hook support member to at least one ladder rung and a hook which is substantially U-shaped in cross section attached to the upper end of the support member, the hook comprising an elongate outer end member and two spaced side members which combine to form a groove adapted to receive the cable of a lift, the longitudinal centerline of the groove extending substantially normal to the longitudinal centerlines of the rungs of the ladder when



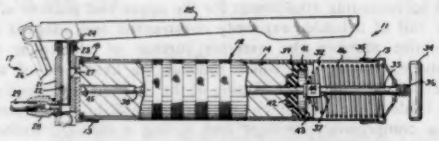
viewed from the top to cause the rungs of the ladder to be positioned substantially parallel to the front or forward end of a chair suspended from the cable and also to aid in preventing twisting of the ladder relative to the cable in use. In a preferred embodiment, a pair of semi-elliptical grooves are provided in the outer end member, one at each end thereof. In another preferred embodiment, the hook also comprises latch means for releasably closing the groove at a locality spaced below the elongate outer end member of the hook.

3,780,830

CARTRIDGE-TYPE GREASE GUNS

Robert J. Helgerud, Hopkins, and Ernest M. Simon, Golden Valley, both of Minn., assignors to K-P Manufacturing Co., Inc., Minneapolis, Minn.

Filed Apr. 24, 1972, Ser. No. 246,728
Int. Cl. G01f *11/06*
U.S. Cl. 184—105 A **11 Claims**



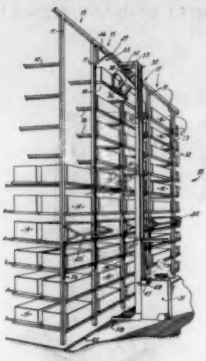
An improved grease gun of the plunger type which uses replaceable grease cartridges. The grease gun consists of a cylindrical container adapted to receive an open ended cylindrical grease cartridge. The plunger is spring biased to urge grease from the cartridge into a discharging device of the piston displacement type. The plunger is guideably carried within the cylindrical container by an elongated rod having a handle portion projecting rearwardly from the container. To insure proper insertion of the plunger into the rearward open end of the grease cartridge, abutment means are disposed at an intermediate point on the elongated rod and movable therewith. Insertion of a fresh grease cartridge into the cylindrical container from its forward end causes the plunger to seat on the cartridge mouth. With the gun assembled for use, forward movement of the rod causes the abutment means to engage and force the plunger into a proper position within the cartridge mouth.

3,780,831

MAST STABILIZER FOR LIFT TRUCKS

Richard W. Dickenson, deceased, late of Pickerington, Ohio (by Winifred Dickenson, executrix), assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Apr. 12, 1972, Ser. No. 243,249
Int. Cl. B66b *9/20, 7/02*
U.S. Cl. 187—9 **16 Claims**



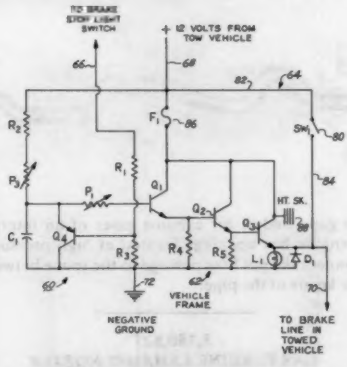
Means for stabilizing the mast of a lift truck so that load sway is reduced and loads can be elevated to greater heights for loading into storage racks. Movement of the mast in a horizontal direction is arrested by a carriage which travels on vertical tracks as the lift truck mast is elevated.

3,780,832

TRAILER BRAKE CONTROL SYSTEM

John J. Marshall, Grand Rapids, Mich., assignor to Aicheles Associates, Inc., Fort Wayne, Ind.

Filed July 3, 1972, Ser. No. 268,748
Int. Cl. B60t *13/74*
U.S. Cl. 188—3 R **9 Claims**



A trailer brake control system for use with the hydraulic brake system of an automobile having a brake light and a switch therefor responsive to fluid pressure, in which an adjustable time base circuit is connected to the light switch and produces a signal which is amplified by an amplifier circuit connecting the automobile electrical power supply with a line to the electric brake mechanism in the trailer. A variable resistor controls the time base circuit and is initially adjusted for the type of brakes and loads for synchronizing the operation of the brakes on the towed and towing vehicles for delaying the

operation of the trailer brakes until the slower acting hydraulic brakes of the automobile have been applied. An emergency circuit controlled by a switch within easy reach of the driver of the automobile, bypasses both the time base and amplifier circuits to control directly the trailer brakes.

3,780,833

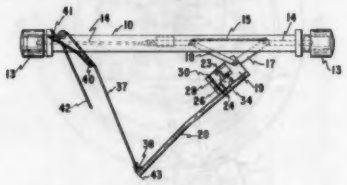
BRAKE FOR FARM WAGON

Henry L. Sundermann, Rt. 4, Box 79, Sioux Falls, S. Dak.

Filed Dec. 27, 1971, Ser. No. 211,907

Int. Cl. B60t *7/20*

U.S. Cl. 188—9 **5 Claims**



A brake system for farm wagons or the like providing brake shoes to engage the side of wheels or tires of the wagon. The shoes are pressed against the tires or wheels by a toggle mechanism actuated by a pull on a rope to engage the brake and a subsequent pull to release the brake. Automatic means enclosed in the tongue of the wagon is adapted to set the brake as a safety device.

3,780,834

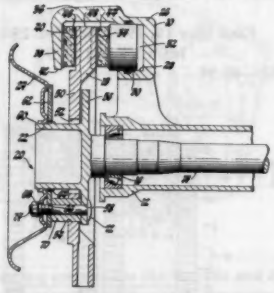
DISC BRAKE ASSEMBLY

Neil M. Lottridge, and Marc F. Momsen, both of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 15, 1973, Ser. No. 323,951

Int. Cl. B60t *1/06*

U.S. Cl. 188—18 A **3 Claims**



A disc brake assembly, particularly adapted for rear brakes, in which the caliper is fixed to the axle housing and a slidable disc is mounted on a live axle extension section so that the disc is easily removable for brake service.

3,780,835

DISC BRAKES FOR VEHICLES

Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Tyseley, Birmingham, England

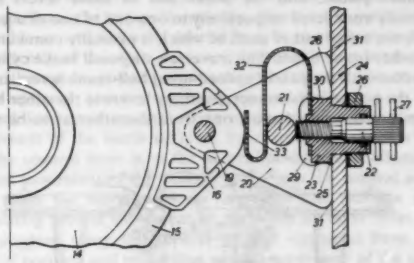
Filed July 20, 1971, Ser. No. 164,356

Claims priority, application Great Britain, July 24, 1970, 35,888/70

Int. Cl. F16d *51/62*

U.S. Cl. 188—74 **2 Claims**

In a disc brake in which a friction member is movable into engagement with the periphery of a rotatable disc in a direction substantially radial with respect to the disc, the friction member or a carrier for it has an engagement with a stationary member of such a form that angular movement of the



friction member with the disc on application of the brake produces a self-servo action urging the friction member towards the disc.

3,780,836

BRAKE ADJUSTER MECHANISMS

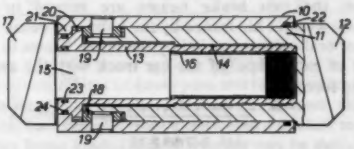
Charles Newstead, Tyseley, Birmingham, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed Apr. 30, 1971, Ser. No. 139,163

Claims priority, application Great Britain, May 1, 1970, 21,101/70

Int. Cl. F16d *65/46*

U.S. Cl. 188—79.5 SC **3 Claims**



A brake adjuster mechanism for drum brakes has a cylindrical housing in which a sleeve is rotatable but restrained against axial movement. The sleeve has an external threaded portion and an internal threaded portion of opposite hands. A tubular adjusting member formed with a tappet at one end and having an internally threaded portion screws over the sleeve with the tappet projecting from one end of the housing. An adjusting member in the form of a shaft formed with a tappet at one end screws within the sleeve with the tappet projecting from the other end of the housing. A worm gear arrangement is provided for rotating the sleeve relative to the housing and the adjusting members are thereby moving the adjusting members towards and away from each other. In the retracted position the adjusting members overlap by an amount nearly equal to the length of the sleeve.

3,780,837

SINGLE CYLINDER TRUCK-MOUNTED BRAKE

Andrew G. Haydu, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

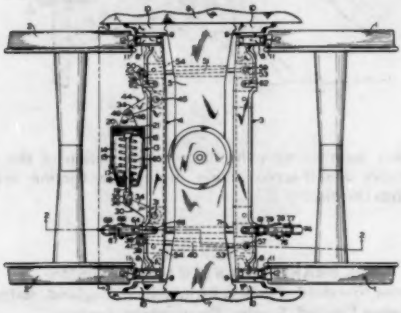
Filed Nov. 13, 1972, Ser. No. 305,858

Int. Cl. B60t *8/22*

U.S. Cl. 188—195 **12 Claims**

A brake rigging for a two-axle four-wheel railway car truck which embodies a brake cylinder disposed traversely between the side frames of the car truck and operatively connected to two parallel brake beams disposed on the respective opposite sides of a truck bolster through a linkage comprising a pair of

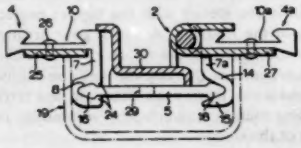
spaced-apart bell-crank levers pivotally mounted on one of the brake beams, one arm of these bell-crank levers being pivotally connected respectively to the body of the brake cylinder and the exterior end of the piston rod of the brake cylinder piston, and the other arm of these levers being pivotally connected respectively to one end of one of a pair of rods, the other end of each of which is pivotally connected to the other brake beam. The traversely disposed brake cylinder, together with the pair of spaced-apart bell-crank levers, insure that the pair of rods connecting these levers to the other brake beam are so spaced apart one from the other as to be sufficiently disposed beneath the truck bolster adjacent the outer ends thereof as to enable adequate vertical movement of the bolster, as the result of truck spring deflection due to load on the car, without movement of the bolster into contact with these rods which would inhibit or prevent free movement thereof. Therefore, while the car is either empty or fully loaded, whenever fluid under pressure is supplied to the brake cylinder, the two brake beams are moved in opposite directions without hindrance by the bolster to cause the application of brake shoes carried by the brake beams to the tread surface of each wheel of the car truck with the same-brake applying force.



3,780,838
LUGGAGE CASE

Jack Slan, Toronto, Ontario, Canada, assignor to Dominion Luggage Co. Limited, Toronto, Canada

Division of Ser. No. 784,510, Nov. 19, 1968, Pat. No. 3,579,804. This application Oct. 29, 1970, Ser. No. 85,164
Int. Cl. A45c *13/04*
U.S. Cl. 190—49 **4 Claims**

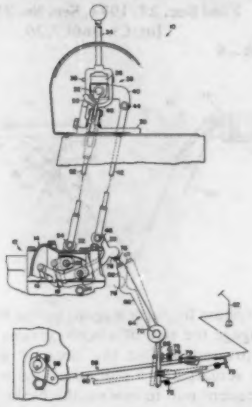


A luggage case comprises two opposed sections hinged together and having confronting edges adapted to interfit when the case is closed. The confronting edges of the sections are formed by matched bent edge strips extending around the sections; and each has a channel where a tongue strip extending around the confronting edges of the sections has one edge thereof permanently inter-locked in one of the channels, the inter-lock being the product of simultaneous bending of the tongue and edge strip, and the other edge of the tongue strip releasably interfitting in the other of the channels when the case is closed. Means is provided for releasably retaining the sections in closed relation.

3,780,839
INTERLOCK FOR TRANSMISSION AND PARKING BRAKE CONTROLS

Kenneth Roger Schroeder, Holy Cross, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 10, 1972, Ser. No. 305,474
Int. Cl. F16d *67/00*
U.S. Cl. 192—4 A **5 Claims**

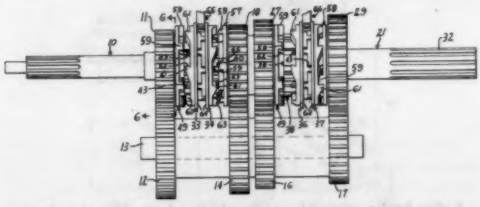


The control linkages for a change-speed transmission and a parking brake have interlocking parts which lock the transmission in neutral either when the transmission is in neutral and the parking brake is then engaged or when the parking brake is applied and the transmission is then shifted into neutral.

3,780,840
GEAR SELECTOR FOR A TRANSMISSION

Dalton A. Thomas, Alpine, Ala., assignor to Hazel A. Beasley, Childersburg; Woodford R. Thompson, Jr.; Hugh P. Carter and William K. Murray, Birmingham, Ala., part interest to each

Filed May 19, 1972, Ser. No. 254,862
Int. Cl. F16d *21/04*
U.S. Cl. 192—48.91 **12 Claims**



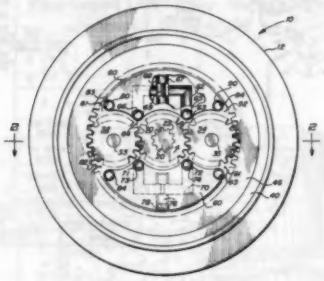
A selector for a transmission having power transmitting rotary members, such as gears, operatively connected to each other and mounted for rotation about an axis common with the axis of a shaft-like member. A gear selector element rotates with the shaft-like member adjacent each gear and is movable axially relative thereto with means urging each gear selector element away from the adjacent gear. Cooperating connector elements rotate with each gear selector element and the gear adjacent thereto. Each gear selector element is shifted toward the gear adjacent thereto by an actuator member to engage said cooperating connector elements until the actuator member is shifted and the connector element rotatable with the gear selector element moves to a position in advance of the connector element rotatable with said gear.

3,780,841

VARIABLE AUTOMATIC TRANSMISSION

William T. Wells, 1750 W. Ajo Way, Tucson, Ariz.

Filed Aug. 3, 1972, Ser. No. 277,911
Int. Cl. F16d 31/04
U.S. Cl. 192—61 6 Claims



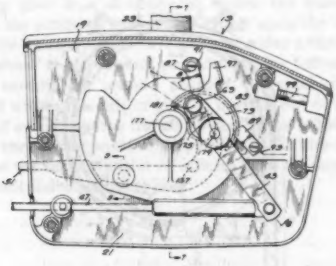
An automatic transmission is disclosed which changes the ratio of gearing between a driving member and a driven member by the use of hydraulic pumps to provide virtually unlimited variable gear ratios.

3,780,842

SINGLE CLUTCH AND THROTTLE LEVER COMBINED WITH A THROTTLE WARM UP LEVER

Roger B. Whipple, Waukegan, and Allan F. Miller, Lindenhurst, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed June 23, 1972, Ser. No. 265,600
Int. Cl. G05g 5/08, 11/00, 13/00
U.S. Cl. 192—0.096 21 Claims



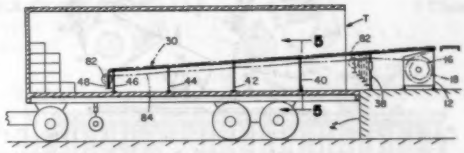
Disclosed herein is a control for the throttle and clutch of a marine propulsion device, which control comprises a control lever mounted on a frame for rotation about a first axis, means operably connecting the control lever to a clutch element movably mounted on the frame to cause clutch element movement in response to control lever movement, a warm up lever mounted on the frame for relative rotation therebetween about a second axis located to one side of the first axis in spaced relation therefrom, means connecting the warm up lever to a throttle arm for relative rotation therebetween about a third axis extending from the intermediate portion of the throttle arm and located below the first and second axes and on the one side of the first axis in spaced relation therefrom at a distance greater than the spacing between the first and second axes, and means operably connecting the control lever and the throttle arm for rocking the throttle arm about the means pivotally connecting the warm up lever to the throttle arm and for providing relative rotation between the control lever and the throttle arm about an axis extending from ajdacent one end of the throttle arm and located above the first axis and to the one side of the first axis at a distance less than the spacing between the first and second axes, whereby when the warm up lever is pivotally moved independently of movement of the control lever, the throttle arm is pivoted about the means connecting the throttle arm to the control lever and when the control lever is pivotally moved independently of the warm up lever, the throttle arm is pivoted about the means pivotally connecting the throttle arm to the warm up lever, and interengaging pin and slot means on the control lever and on the warm up lever affording pivotal movement of the warm up lever from an idle position when the the control lever is in the neutral position and affording pivotal movement of the control lever from the neutral position when the warm up lever is in the idle position and preventing pivotal movement of the warm up lever from the idle position when the control lever is displaced from the neutral position and preventing pivotal movement of the control lever from the neutral position when the warm up lever is displaced from the idle position.

3,780,843

VARIABLE-LENGTH CONVEYOR

Harold Joseph McGovern, Jr., Metairie, and Louis Albert Granja, New Orleans, both of La., assignors to United Brands Company, Boston, Mass.

Filed July 7, 1972, Ser. No. 269,729
Int. Cl. B65g 13/00
U.S. Cl. 193—35 TE 8 Claims



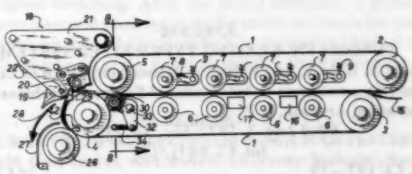
This invention relates to conveyors and more particularly to a variable,length conveyor adapted to extend different distances as, for example, from a dock into a docked trailer so that articles being loaded into the trailer can be delivered at the output end of the conveyor at any point along the length of the trailer interior from the front to the rear as loading proceeds.

3,780,844

TICKET ACCEPTING MACHINES IN PARTICULAR FOR PUBLIC TRANSIT SYSTEM

Joseph Bali, 5059 Marsonneuve St., Montreal, Quebec, Canada

Filed Sept. 11, 1972, Ser. No. 288,063
Int. Cl. G07b 11/04
U.S. Cl. 194—4 1 Claim



Tickets accepting machines arranged to curtail presently known ways of fraudulously using admission tickets, including transfers, to gain access into a public transit system. The tickets accepting machines are each provided with a ticket

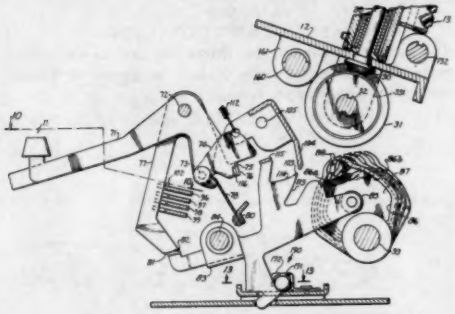
multilating device whereby any ticket issuing from the machine, either legally or illegally, is visibly mutilated and improper for re-use in a tickets accepting machine of at least the same type. The mutilating device includes a rotary cutter arranged to severe a portion of each ticket inserted into the machine.

3,780,845

POWER DRIVEN TYPEWRITER WITH SINGLE TYPE HEAD

Robert E. Boyden, Temple City, Calif., assignor to Thomas O'Reilly, Santa Barbara, Calif.

Filed Sept. 4, 1970, Ser. No. 69,542
Int. Cl. B41j *23/04, 1/46*
U.S. Cl. 197—18 **16 Claims**



A power driven typewriter comprising a shiftable carrier supporting a rotatable and axially movable flexible type drum having a plurality of circumferentially extending rows of type characters thereon. Type keys, when depressed, each condition one each of two groups of actuators and cause operation of a power driven cyclically operable clutch which drives a power bail to operate the two conditioned actuators, one of which is effective to rotate the type drum from any position it may be in to a new position and the other actuator being effective to raise or lower the type drum from any position it may be in to a new position to thus align a type character corresponding to the key depressed at the printing position. Upon alignment of a selected type character, the type drum is flexed radially to cause an imprint. Means are provided to dampen torsional oscillation, wobble, etc. of the drum prior to imprinting.

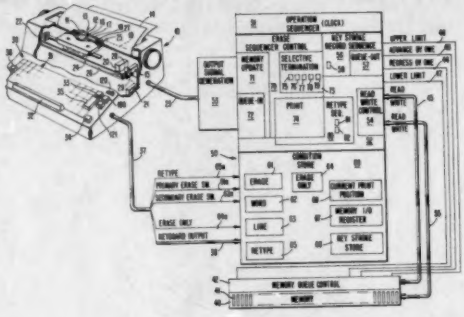
3,780,846

AUTOMATIC ERASING TYPEWRITER SYSTEM

Robert A. Kolpek, and Robert A. Rahenkamp, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1972, Ser. No. 277,718
Int. Cl. B41j *5/30*
U.S. Cl. 197—19 **20 Claims**

A typewriter having a character erase mechanism is combined with an automatic control system including a changeable memory that maintains a record of both characters printed and characters erased to enhance the typist's ability to edit and correct text as it is typed. With this system the typist can select automatic erasure of individual characters, selected words, or an entire line simply by depression of a key. Furthermore, typist can add, delete or correct words as desired and



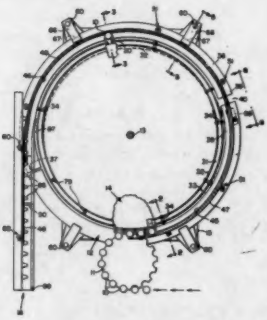
the typewriter will automatically reprint correct text that was erased to enable such insertion or deletion.

3,780,847

ROTARY FILLING MACHINE

Adelmar Faessler, Rochester, and Stewart E. Engle, Fairport, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

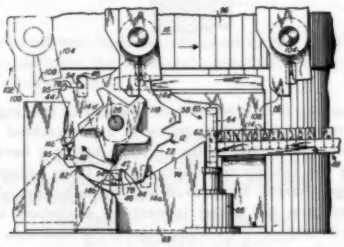
Filed Jan. 13, 1972, Ser. No. 217,575
Int. Cl. B65g *47/00*
U.S. Cl. 198—25 **15 Claims**



Containers being filled with flowable material are held beneath filling assemblies on a rotating filling wheel by chucks and guide rails. Two chucks, one positioned above the other, are attached to the filling wheel by pivoted levers at each filling station. A cam follower connected to one of the chucks rides in a cam track defined by two strips which extend around the filler. These cam strips and some of the guide rails are attached to two ring segments. One of the segments is fixed in place and the other is pivoted at one end. When the free end of the pivoted ring segment is moved away from the fixed segment, the portion of the cam track attached to the pivoted ring segment, one bottom guide rail and one outer guide rail are moved away from the axis of rotation of the filling wheel; and the containers passing above this segment are gradually tilted. The containers are untilted as they move off the filling wheel onto a discharge conveyor by the guide rails and by a

discharge guide. The discharge guide is connected to one of the movable guide rails so that it moves with it.

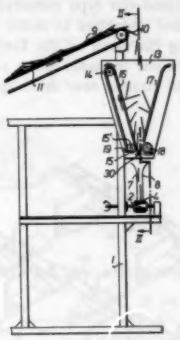
3,780,848
ARTICLE TRANSFERRING MECHANISM
Henry G. Studeny, La Grange Park, Ill., assignor to Western Electric Company Incorporated, New York, N.Y.
Filed Sept. 13, 1972, Ser. No. 288,659
Int. Cl. B65g *47/00*
U.S. Cl. 198—25 **10 Claims**



An article transfer wheel is formed from two circular discs, each having a plurality of article receiving indentations around the periphery thereof, mounted in a spaced relationship for rotation about an axis. Upon rotation of the transfer wheel successive elongated articles, from a supply of the articles, are received at each of their ends within an indentation on a different one of the discs at a first position along the periphery of the transfer wheel, and are rotated to a second position along the periphery of the transfer wheel which is arcuately spaced from the first position. Each article at the second position is pushed by one pair of successive pairs of clamping jaws in a direction to rotate the transfer wheel through the action of the pushed article upon the wheel. This causes the transfer wheel to rotate successive articles from the first position to the second position. As the following article rotates toward the second position, the pushed article is clamped within the pair of jaws to carry it out of its indentations and away from the transfer wheel as the following article reaches the second position. Repetition of the above sequence results in the serial transfer of articles from the supply of articles to successive clamping jaws.

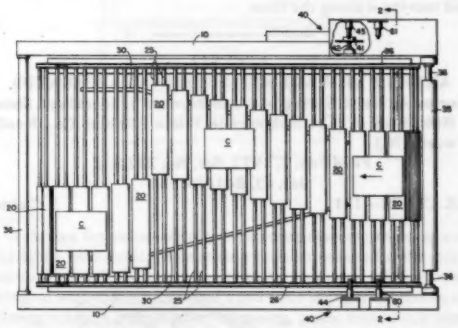
3,780,849
APPARATUS AND METHOD FOR ARRANGING FLAT ARTICLES ON A TROUGH CONVEYOR
Bernhard Hoehl, Litzelstetten, and Karl-Heinz Kummerer, Constance, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Continuation of Ser. No. 67,931, Aug. 28, 1971, abandoned. This application May 8, 1972, Ser. No. 251,222
Claims priority, application Germany, Aug. 30, 1969, P 19 44 180.6
Int. Cl. B65g *47/26*
U.S. Cl. 198—30 **9 Claims**

A funnel arrangement for delivering a uniform flow of flat articles to a trough conveyor, the funnel being arranged over the trough conveyor and two of the side walls of the funnel being parallel to the direction of movement of the trough conveyor, one side wall being constituted by an upwardly moving reach of a conveyor belt and at least part of the other side wall being formed by a conveying means opposite the lower part of the conveyor belt, the conveying means and the conveyor belt cooperating to form a slit-shaped outlet opening in the bottom of the funnel through which the flat articles are directed



downwardly by the conveying means onto the trough conveyor in a substantially uniform manner.

3,780,850
SLIDING PALLET ARTICLE SORTER
James L. McSwiggin, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Oct. 6, 1972, Ser. No. 295,638
Int. Cl. B65g *47/26*
U.S. Cl. 198—31 AC **1 Claim**

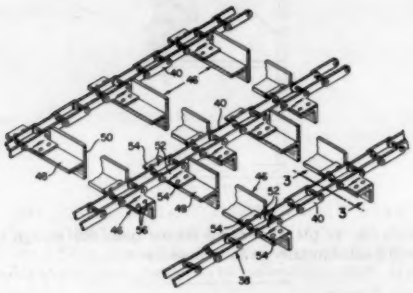


A sorter for articles, typified by cases of product, of the type wherein the cases are delivered to a single infeed station and discharged at one of two or more stations is provided. A plurality of "pallets" traverse an endless loop and slide laterally along rod-like members. The lateral movement is controlled by a diverting means which is responsive to a control signal and contacts a first protrusion, typically a pin, on the pallets. Preferably, the diverting means is articulated to provide very high speed switching. After the initial diversion, a guide rail contacts a second protrusion on the pallet and leads the pallets axially along the rod-like members to the desired lateral location for discharge as the pallet progresses along the sorter.

3,780,851
CROP FEEDING CONVEYOR FOR A HARVESTER
Darwin Carl Bichel, and Robert La Verne Malcolm, both of East Moline, Ill., assignors to Deere & Company, Moline, Ill.
Filed June 29, 1972, Ser. No. 267,506
Int. Cl. B65g *19/00*
U.S. Cl. 198—175 **3 Claims**

A self-propelled combine has a main separator body with a forward crop inlet and a feeder housing extending forwardly

from the crop inlet. A transversely elongated harvesting header is mounted on the forward end of the feeder housing and delivers the crop through a crop transfer opening in its rear wall to a chain-and-slat type conveyor mounted within the feeder housing and operative to move the crop upwardly and rearwardly along the floor of the feeder housing to the body inlet. The conveyor includes three transversely spaced chains trained around coaxial rear drive sprockets and a forward feeder drum. The chains are interconnected by transverse slats, which are arranged in staggered rows. Each chain has a T-shaped cross section with a stem portion parallel to the floor of the feeder housing in the lower run of the conveyor, the opposite ends of the stem portions being attached to one of the outer chains and the center chain. The cross portion of each slat in the lower run of the conveyor is normal to the floor and in advance of the stem portion for engaging the crop and moving it along the floor.

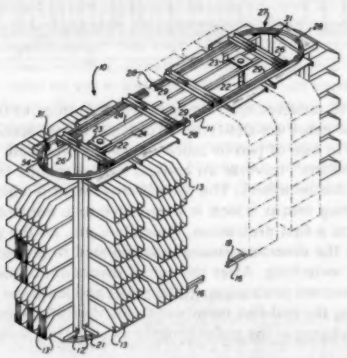


3,780,852

ARTICLE STORAGE AND RETRIEVAL APPARATUS

Morton A. Weiss, Springfield, and Bernard S. Speckhart, Short Hills, both of N.J., assignors to White Machine Co., Kenilworth, N.J.

Filed Feb. 2, 1972, Ser. No. 222,832
Int. Cl. B41j *29/16*
U.S. Cl. 198—181 **5 Claims**



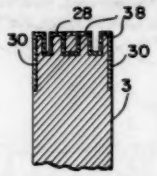
Apparatus for the storage and retrieval of inventories of articles of manufacture. The apparatus includes a vertical frame having a continuous oval track located at the base of the apparatus. A continuous conveyor is supported on the frame and guided on the oval trackway. The conveyor includes a plurality of side by side articulated, rigid support members of racks guided in a vertical attitude on the vertical frame. A plurality of vertically spaced storage bins are detachably secured on the support members or racks.

3,780,853

TYPE CASTING MATRIX AND SPACING

Robert R. Kuhn, 121 East Ln., Winchester, Va.

Filed May 19, 1971, Ser. No. 144,791
Int. Cl. B41b *1/02*; B41c *3/08*
U.S. Cl. 199—63 **4 Claims**



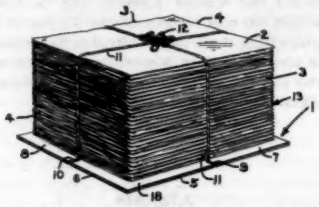
A type casting matrix and a matrix spacer or spacing for insertion between adjacent matrices in an assembled line of matrices for spacing the matrices, each having a hard metal coating on the casting edge and casting faces adjacent the casting edge thereof for preventing the adhesion of metal thereto during a hot metal typesetting operation and for preventing damage to the casting edge of the matrices. A plating holder is also provided for simultaneously plating a plurality of matrices and spacings on only the casting edges and casting bearing faces thereof; and the process of plating said matrices and spacings wherein the matrices and spacings are first cleaned to remove lead and other contaminants from the casting edge and casting bearing faces thereof and are then plated with a suitable hard metal alloy such as nickel cobalt alloy or the like.

3,780,854

PAPER STORAGE AND BALING CONTAINER

Wayne W. Ruppenthal, 1727 High, Topeka, Kans.

Filed June 28, 1971, Ser. No. 157,424
Int. Cl. B65b *13/18*; B65d *85/00*
U.S. Cl. 206—46 R **5 Claims**



A paper storage and baling device consisting of substantially rigid board member on which to stack half-folded newspapers and the like, said board member containing pre-determined lengths of baling strands to be pulled out and secured around a sufficient quantity of stacked papers forming a bale or bundle.

3,780,855

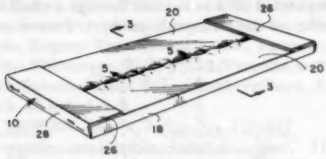
WINDING BOARD

John W. McLeod; Laverne E. Gray, and John F. Booth, all of Dallas, Tex., assignors to Lone Star Container Corporation, Dallas, Tex.

Filed Oct. 1, 1971, Ser. No. 185,545
Int. Cl. B65h *75/06, 75/26*
U.S. Cl. 206—50 **26 Claims**

A winding board for providing a rigid member about which a length of cloth or the like may be wrapped constructed from corrugated material bent in the form of a rectangular tube

with the edges of said corrugated material forming a central web extending the length of said winding board and wherein protrusions are formed in the exterior of said board adjacent



said web and end flaps are attached to the exterior of said board to increase the frictional contact forces between said board and said cloth.

3,780,856

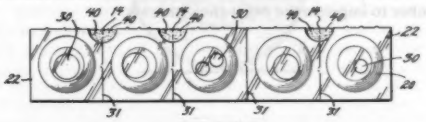
MEDICINAL DISPENSING DEVICE

Milton Braverman, Philadelphia, Pa., assignor to Medi-Dose, Inc., Sellersville, Pa.

Filed July 26, 1971, Ser. No. 166,165

Int. Cl. B65d *83/04, 85/56*

U.S. Cl. 206—56 AB **2 Claims**



A medicinal dispensing device comprising a plurality of flanges having corners and being detachably connected along certain lines so that each flange may be separated from the remaining flanges, a chamber with an outer opening depending from each flange, the chamber being adapted to hold a drug, tablet, capsule, etc., a continuous closure member covering said chamber openings with certain portions of the interior surface of the closure member being in contact with the flanges, the clsoure member being perforated along certain lines closely corresponding to the flange lines, certain portions of the interior surface of the closure member being provided with a tacky adhesive coating which is in contact with said flanges, and certain other areas of the interior surface of the closure member being non-tacky and covering the chamber openings, at least one corner of each flange being removed in a cut-away area so that the existing corner of the closure member overlies the cut-away area to function as a lift tab to facilitate the separation of a portion of the closure member from a particular flange to provide access to the contents of the chamber.

The flanges are preferably provided in groups of 25, there being a cut-away area for at least one corner of every flange that is provided by the formation of a minimum number of punched openings, which minimum number is far less than the total number of 16 intersections that exist in a 5 × 5 pattern of flanges.

3,780,857

INSTRUMENT PACKAGE WITH STERILE FIELD

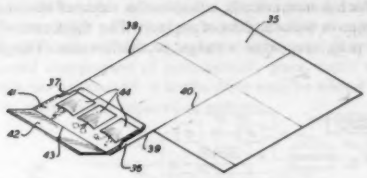
Joseph G. Rosano, Jr., Roselle Park, and Vincent L. Vaillancourt, Livingston, both of N.J., assignors to C. R. Band, Inc., Murray Hill, N.J.

Filed Dec. 30, 1971, Ser. No. 214,338

Int. Cl. A61b *19/02*

U.S. Cl. 206—63.2 **6 Claims**

A sterilizable sealed plastic sheet or film package containing a folded sheet of material adapted to form a sterile field when unfolded, said sheet being reinforced in a limited area by means of an attached relatively stiff sterilizable piece of cardboard, and said package also containing optionally, one or more instruments.



3,780,858

DEVICE FOR AUTOMATICALLY PRESENTING DOCUMENTS ON A READING TABLE

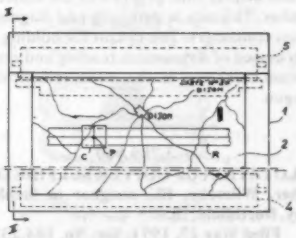
Andre Derre; Pierre Robert, both of Valence, and Claude Vuillemin, Etolle-sur-Rhone, all of France, assignors to Crouzet, Paris, France

Filed Feb. 5, 1973, Ser. No. 329,344

Claims priority, application France, Feb. 4, 1972, 72.04047

Int. Cl. B07c

U.S. Cl. 209—73 **9 Claims**



A device for automatically presenting documents on a reading table, said device comprising support means for the documents each of which is suspended by its upper edge which is integral with a rigid rod, said rigid rods being disposed in adjoining relation on said support means, guide means in a plane located above the plane of the support means, two endless bands which are driven in synchronism, each of which bands is disposed above the support means, the lower reach of each of said bands being substantially in the plane of said guide means, each of the bands comprising on its outer face a transverse recess arranged to be capable of receiving the end portion of a rod, and only one rod, said recesses being in alignment, and means for raising a rod, and only one rod, above the plane of the support means and bringing it above the plane of said guide means.

3,780,859

APPARATUS AND METHOD FOR DISPLAYING THE MINIMUM THICKNESS OF A DIELECTRIC MEMBER MEASURED BY A RADIO FREQUENCY THICKNESS GAUGE

Gerald F. Scherf, Holland, Ohio, and Robert D. Kohler, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

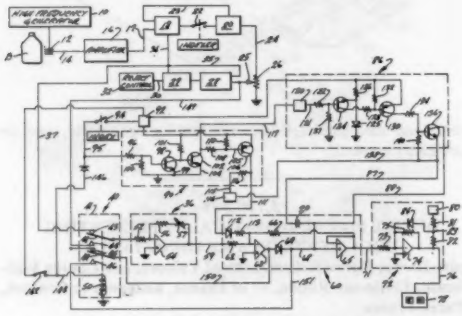
Filed Feb. 8, 1973, Ser. No. 330,511

Int. Cl. B07c *5/08*

U.S. Cl. 209—73 **12 Claims**

Apparatus and method for displaying the minimum thickness of a glass container which is measured for thickness

by a radio frequency thickness gauge. One type of thickness measuring device for glass containers uses the attenuation of a radio frequency signal as a linear measure of thickness in terms of voltages. The output voltage is scaled to obtain a voltage which is numerically equal to the value of thickness of the container in thousandths of an inch. The thickness of the container may vary over a range of thicknesses. This invention



will hold the minimum thickness measured for a particular container and display this, in terms of the scaled voltage, as a digital number. This aids in detecting and diagnosing thickness flaws in glass containers. The circuit for holding the minimum thickness is erased of its previous reading and reset to accept a new minimum thickness as the measurement of a new container is begun.

3,780,860

FLOTATION OF COPPER SULFIDE ORES

Elias Fischer, Wilmette, Ill., assignor to Stephan Chemical Company, Northfield, Ill.

Filed May 17, 1971, Ser. No. 144,232

Int. Cl. B03d *1/06*

U.S. Cl. 209—167 **8 Claims**

A novel flotation promoter used in the concentration of copper-bearing ores for the efficient selective flotation of copper values, including chalcopyrite, with suppression of iron pyrites; the promoter comprising a sodium sulfate of an aliphatic hydrocarbon having a carbon chain of less than 12 carbons.

3,780,861

GRANULAR FILTER MEDIUM

Gene Hirs, Detroit, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Jan. 19, 1972, Ser. No. 219,145

Int. Cl. B01d *23/24*

U.S. Cl. 210—80 **1 Claim**

A method for filtering contaminants from suspension in liquids by utilizing, as a filter medium, granulated shells of black walnut (Juglans nigra L.).

3,780,862

VORTEX OIL-WATER SEPARATOR SYSTEM PROVIDING CLEAN WATER

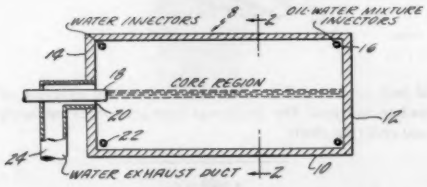
Arthur E. Mesing, East Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 1, 1972, Ser. No. 230,665

Int. Cl. B01d *21/26*

U.S. Cl. 210—84 **7 Claims**

A vortex separator is used to separate a mixture of materials of different densities, such as an oil-water mixture, into two components. The mixture is injected tangentially into one end of a cylindrical chamber at a high flow rate to impart a swirl to the flow in the chamber. Clean or recirculated water is injected into the chamber from the opposite end wall. The separated water is exhausted from the chamber through a port in the center of the end wall containing the water injectors, and the separated oil is exhausted through a small duct located at the center of the water exhaust port. Two or more separa-



tors may be connected in series for applications in which a ship's ballast or bilge water is separated into a first component containing primarily oil which can be stored in a small volume, and a second component of substantially pure water which may be dumped overboard. A baffle plate may be added in the chamber to improve the separation process.

3,780,863

LIQUID FILTER

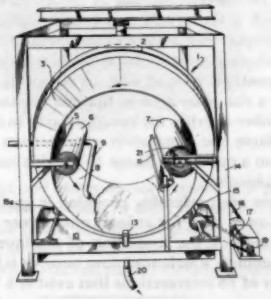
Douglas J. N. Light, Toronto, Ontario, Canada, assignor to Pollution Control Systems (International) Limited, Thornhill, Ontario, Canada

Filed July 10, 1972, Ser. No. 270,491

Claims priority, application Canada, Apr. 28, 1972, 140807

Int. Cl. B01d *33/18, 33/04*

U.S. Cl. 210—97 **14 Claims**



Liquid filtration apparatus has a drum mounted for rotation about a horizontal axis. A filter material is fed in the direction of rotation of the drum onto a lowermost region of the interior of the drum, and liquid to be filtered is discharged onto the filter material in this region. The filtered liquid is discharged from the drum through a slot extending around the wall of the drum, the inner surface of the wall being of concave cross-section and a heater dehumdifies the used filter material before it is wound up on a take-up roll within the drum.

3,780,864

METHOD AND APPARATUS TO REFINE MELTS FROM SOLID IMPURITIES

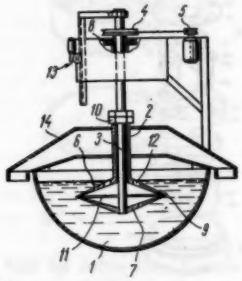
Anatoly Vladimirovich Dolgov, Morskoi prospekt, 36, kv. 30; Leonid Vladimirovich Konovalov, ulitsa Permskaya, 1; Leib Benyaminovich Perkis, ulitsa Geodezicheskaya, 23, kv. 53; Stanislav Lvovich Deev, ulitsa Kirova, 80, kv. 44; Vitaly Evgenievich Dyakov, ulitsa Petukhova, 132, kv. 65; Alexandr Efimovich Semenov, ulitsa Zorge, 133, kv. 33, all of Novosibirsk; Evgeny Teodorovich Bauer, Fergana, poselok Kirgili, ulitsa Shirotnaya, 21 4, kv. 23, Fergana, and Serafim Nikolaevich Suturin, ulitsa Savvy Kozhevnikova, 2, kv. 22, Novosibirsk, all of U.S.S.R.

Filed Jan. 26, 1972, Ser. No. 220,847

Claims priority, application U.S.S.R., Mar. 31, 1971, 1636140; Mar. 2, 1971, 1629152; Nov. 20, 1967, 1197564; Nov. 4, 1969, 1374168

Int. Cl. B01d *35/02, 35/18*

U.S. Cl. 210—152 **4 Claims**



The method provides for filtration in the field of centrifugal forces generated in a filter immersed into the layer of a melt to be refined, with the solid impurities accumulating in the filter being strained from the residual melt beyond said layer of the melt to be refined.

The apparatus comprises a melt bath provided with a rotor located thereabove and having a filter rigidly attached at bottom of the rotor, and being provided with a drive for immersing said filter into the melt.

3,780,865

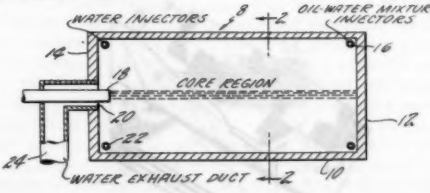
VORTEX OIL-WATER SEPARATOR SYSTEM PROVIDING CLEAN WATER

David P. Miller, South Windsor, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 1, 1972, Ser. No. 230,663

Int. Cl. B01d *21/26*

U.S. Cl. 210—195 **9 Claims**



A vortex separator is used to separate a mixture of materials of different densities, such as an oil-water mixture, into two components. The mixture is injected tangentially into one end of a cylindrical chamber at a high flow rate to impart a swirl to the flow in the chamber. Clean or recirculated water is injected into the chamber from the opposite end wall. The separated water is exhausted from the chamber through a port in the center of the end wall containing the water injectors, and the separated oil is exhausted through a small duct located at the center of the water exhaust port. Two or more separators may be connected in series for applications in which a ship's ballast or bilge water is separated into a first component containing primarily oil which can be stored in a small volume, and a second component of substantially pure water which may be dumped overboard. A baffle plate may be added in the chamber to improve the separation process.

3,780,866

METHOD FOR THE SEPARATION OF SUBSTANCE MIXTURES BY CHROMATOGRAPHY AND A COLUMN MEANS ADAPTED TO BE USED FOR THE METHOD

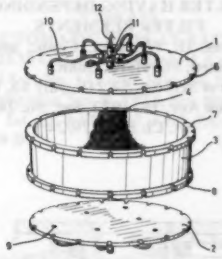
Leif V. Ek, Jarfalla; Per L. Wallin, Uppsala, and Thure P. M. Tibbling, Bjarred, all of Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Nov. 16, 1971, Ser. No. 199,158

Claims priority, application Sweden, Nov. 20, 1970, 15713/70

Int. Cl. B01d *15/08*

U.S. Cl. 210—198 C **1 Claim**



The present invention is concerned with a method for the separation of substance mixtures by chromatography. More particularly, the invention pertains to an improvement in a method for the separation of substance mixtures by chromatography while using a separating medium bed, a solution of the mixture to be separated being charged into the bed and an eluting agent being supplied to the bed in order to force liquid therethrough to recover at least two fractions of the substance mixture and the bed being maintained divided into at least two separate portions.

3,780,867

WATER PURIFICATION APPARATUS AND CARTRIDGE THEREFOR

Joseph V. Zirlis, Branford, Conn., assignor to H. N. Industries Inc., New Haven, Conn.

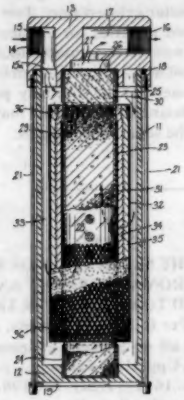
Filed Dec. 27, 1971, Ser. No. 212,029

Int. Cl. B01d *27/02*

U.S. Cl. 210—266 **14 Claims**

Two-stage water purification apparatus having a cartridge disposed within a housing provided with a removable cap. The cartridge comprises a casing containing activated charcoal, two superposed grid-like sleeves surrounding the casing, and a

diatomaceous earth layer between the two sleeves. Incoming water circulates from an inlet port in the cap through the outermost sleeve to the interior of the cartridge, and then out through an outlet port in the cap.



3,780,868

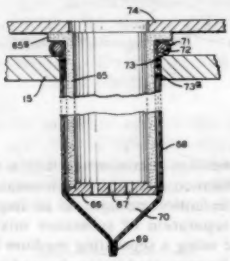
PRESSURE FILTER HAVING DEPENDING TUBULAR FILTER ELEMENTS

Harry Victor Miles, II, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation of Ser. No. 54,216, July 13, 1970. This application Apr. 19, 1972, Ser. No. 245,636

Int. Cl. B01d *29/24*

U.S. Cl. 210—333 **14 Claims**



A pressure filter unit equipped with depending tubular filter elements comprising a tubular filter fabric element surrounding a rigid tubular liquid-permeable backing member, featuring an improved simple lead proof connection between the top ends of the filter elements and the supporting tube plate in the filter unit, which connection is resistant to backwash pressure supplied to the tubular filter elements through the upper open ends thereof.

3,780,869

MULTIPLE WATER-FILTER DEVICE

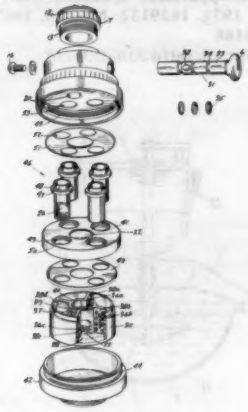
Zaharias Krongos, 128 Sherman Ave., New York, N.Y.

Continuation-in-part of Ser. No. 174,084, Aug. 23, 1971. This application May 16, 1973, Ser. No. 360,754

Int. Cl. B01d *29/24*

U.S. Cl. 210—317 **7 Claims**

In a preferred embodiment of the invention, a water-filter device is provided in which there are a plurality of insert filters into different compartments which insert filters are easily removed by unscrewing a bottom male portion from a top female portion, with the water being channeled to the respective filter compartments in parallel flow with one-another with the outlets of the several filter inserts being into the respective compartments and with the compartments being in flow series with one-another from a first compartment receiving water solely from the outlet of its insert filter to a final compartment of the series which has an outlet into a channel in flow communication with the main device water outlet, the compactness of filter material preferably of sheeps' wool varying from compartment to compartment in the flow series of compartments, with the first compartment of the series having an insert of least insert filter material density and the last compartment of the series having an insert filter of filter material of the greatest density, filter material being also in the compartment of the flow series with the filter material being outside of the inserted filter, the filter material out of the inserted filters being of about the same density for each of the series of compartments, and there being additionally provided a valve mechanism for alternately passing water through the filters when the valve is in one position and through a bypass conduit bypassing the filters in their entirety when the valve is in an alternate position, the valve being preferably manually controllable, a good part of the utility of the present invention being the high efficiency of the fiber system together with the ease of access to and replacement of the insert filters.



3,780,870

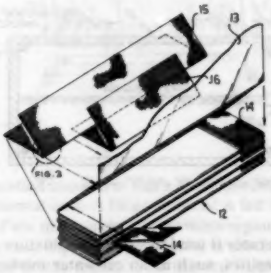
ARTIFICIAL BODY MEMBER

William G. Esmond, 537 Stamford Rd., Baltimore, Md.

Filed Feb. 22, 1972, Ser. No. 227,845

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **6 Claims**



Artificial body member, such as a kidney or lung wherein either impurities are removed from blood or oxygen added

thereto. The artificial body member includes a pleated web defining alternating first and second flow paths for blood in a treating fluid with the flow paths being maintained for the flow of fluids therethrough by means of spacers, the spacers being in the form of folded strips of mesh web material, this whole assembly being a core which is disposed within a housing and the housing having manifolds for the distribution of fluids.

3,780,871

DISPOSABLE LINER FOR COFFEE FILTER BASKET

Tommie Earl Hicks, Star Route, P.O. Box 22D, and Lavern John Amestoy, P.O. Box 460, both of Conrad, Mont.

Filed May 15, 1972, Ser. No. 253,274

Int. Cl. B01d *29/04*

U.S. Cl. 210—471 **4 Claims**

A disposable liner for coffee filter baskets used in coffee brewing pots of the type which includes the coffee supporting basket is disclosed as a removable member having a bail attached thereto for handling the liner. The liner is formed of a non-woven fiber material of a generally cylindrical form having a horizontal bottom wall with a hole formed therein to permit the perculator conduit to extend upwardly therethrough. An aluminum foil cover encloses the side walls of the liner and is stitched thereto to add strength to the side walls. The bail is used for removing the liner and the used coffee grounds following the making of the coffee with the liner preventing any grounds from reaching the coffee cup.

3,780,872

FILTERS COMPRISING ANISOMETRIC COMPRESSED AND BONDED MULTILAYER KNITTED WIRE MESH COMPOSITES

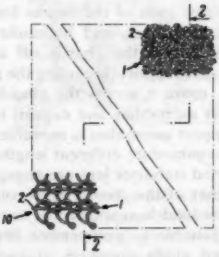
David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Division of Ser. No. 732,443, May 27, 1968, Pat. No. 3,690,606

Filed Sept. 29, 1970, Ser. No. 76,633

Int. Cl. B01d *27/06*

U.S. Cl. 210—493 **21 Claims**



Filters and filter units are provided which comprise as the filter sheet anisometric compressed and bonded knitted wire mesh composites composed of a plurality of sheets of knitted wire mesh, superimposed at random orientation with respect to each other, compressed or densified to a voids volume within the range from about 10 to about 90 percent, and bonded together. The sheets are taken in sufficient number, usually at least five and preferably ten or more, and as much as 1,000 or more, to form a self-supporting relatively nonresilient composite of high tensile strength and high breaking strength having an average pore diameter of less than 200 microns, and preferably less than 100 microns, that is relatively uniform in any unit area of the surface, and having an anisometric porosity, the through pores extending crosswise of the sheet greatly exceeding in number the through pores extending laterally of the sheet, which latter pores can be reduced virtually to zero in a highly compressed composite.

The composite is formed by superimposing a plurality of knitted wire mesh sheets, annealing the composite to avoid wire breakage during later processing, compressing the composite to the desired density and anisometricity by application of pressure in a direction approximately perpendicular to the plane of the layers of the composite, and bonding the sheet layers and wire filaments of the sheets together at their points of contact and/or crossing. The bonding holds the composite at the selected density, prevents relative movement of the wires in the composite, and in conjunction with the multilayer structure imparts the self-supporting nonresilient characteristic, together with high tensile strength and high breaking strength.

3,780,873

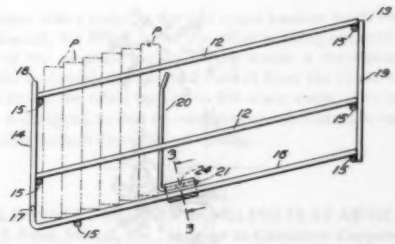
AUTOMATIC DISPLAY RACKS

Albert J. Silva, 2534 Oakes Dr., Hayward, Calif.

Continuation of Ser. No. 141,646, May 10, 1971, abandoned. This application Jan. 8, 1973, Ser. No. 321,802

Int. Cl. A47f *1/00, 3/00, 7/03*

U.S. Cl. 211—49 D **2 Claims**



An automatic, package-positioning display rack adapted to stack uniformly sized packages in one or more compartments. The individual compartments are sloped downwardly from back to front causing the packages to slide forward whenever a gap is created by the removal of one or more of their number being removed from the rack. A slidably mounted stacker is provided which, bearing against the rearmost package of a group, ensures that this action will take place immediately upon the removal of any package.

3,780,874

UTILITY TREE

Hershel Stacy, Sr., Dice, Ky.

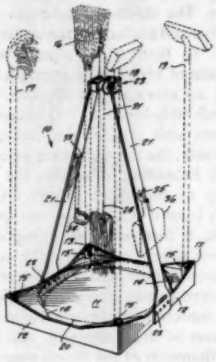
Filed Mar. 24, 1972, Ser. No. 237,783

Int. Cl. A47b *81/02*

U.S. Cl. 211—65 **2 Claims**

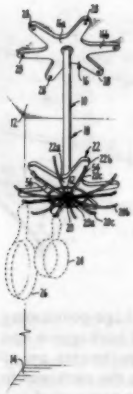
A unit for storing various household cleaning implements; the unit consisting of a shallow square pan that supports on opposite sides a pair of upwardly converging legs which at their top have a bracket for supporting a depending wet or dry

mop over the center of the pan; the corners of the pan having integral vertical sleeves for storing a broom, dust mop, waxer and sponge mop; each of the inclined legs additionally having



hooks along an intermediate post thereof for storing a dust pan and commode brush, while the pan is adaptable to receive a removable tray or pan which can be easily emptied of dripping water from a wet mop.

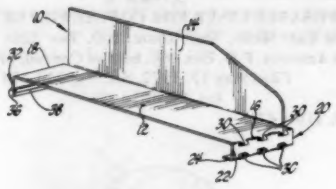
3,780,875
SUSPENDED HANGER
Lillian L. Scholl, 2545 Rivera St., San Francisco, Calif.
Filed June 14, 1972, Ser. No. 262,638
Int. Cl. A47f 5/08
U.S. Cl. 211—115 **2 Claims**



A hanger for suspending articles, such as pots and pans, from an overhead surface.

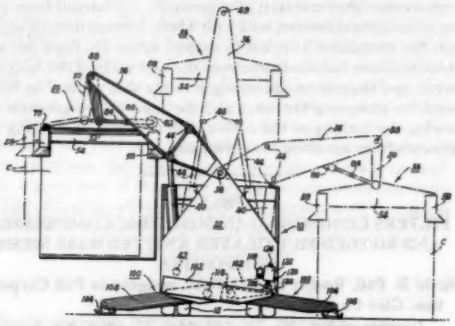
The hanger comprises a base member adapted to be secured to the overhead surface, a column secured to and suspended from the base member, a hanger assembly secured to the lower end of the column for rotation about the axis of the column, and an intermediate member secured to the column above and adjacent to the hanger assembly. In the preferred embodiment, the hanger assembly and intermediate member each comprise a hub having a plurality of spokes extending radially therefrom and the hanger assembly is rotatable relative to the intermediate member whereby the spokes of the assembly may be selectively moved out of alignment with the spokes of the intermediate member.

3,780,876
SHELF DIVIDER
Bobby L. Elkins, Parchment, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Jan. 18, 1972, Ser. No. 221,460
Int. Cl. A47f 5/00
U.S. Cl. 211—184 **2 Claims**



An adjustable shelf divider for shelving that includes a downwardly extending leg portion and return flange that wraps around the forward edge of a shelf and a downwardly extending leg portion and an offset irregularity thereon that engages over and pushes against the rearward edge of a shelf whereby the shelf divider is held firmly on a shelf.

3,780,877
FREIGHT CONTAINER TRANSFER MECHANISM
Semond Levitt, Huntingdon Valley, Pa., assignor to Gilbert Flexi-Van Corporation, New York, N.Y.
Filed Dec. 30, 1971, Ser. No. 214,037
Int. Cl. B66c 23/00
U.S. Cl. 212—8 B **1 Claim**



Freight container transfer apparatus having a pair of lifting beams mounted on support assemblies at opposite end portions of an elongated chassis for pivotal movement between opposite sides of the chassis, with spreader assemblies suspended at the outer ends of the beams for engaging the upper corners of a container, and hydraulic cylinders for swinging the beams to lift the chassis off a railroad car, highway trailer or other support (including the ground) at one side of the chassis, move it across the chassis in the space between the support assemblies and deposit it on the other side. One of the support assemblies is movable longitudinally of the chassis to accommodate different lengths of container. Hydraulically actuated stabilizer legs are engageable with the ground at each corner of the chassis to prevent overturning the chassis when the load is supported at one side, the legs being vertically adjustable to compensate for variations in ground level. Flared guide members at each end of the spreader assemblies are engageable with the corners of the container as the spreader assemblies are lowered onto the container to align them automatically with the corners of the

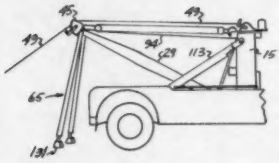
container. Hydraulically actuated hanger links are pivotally connected between spreader assemblies and the ends of the beams to allow lateral movement of the spreader assemblies to compensate for greater lateral misalignment of the spreader assemblies with the container. Hydraulically actuated locks are provided for engagement with the corners of the container.

3,780,878

BOOM ASSEMBLY FOR LIFT AND TOW TRUCK

Dennis W. Morrow, Livonia, Mich., assignor to Eagle Industries, Inc., Dearborn, Mich.

Filed July 31, 1972, Ser. No. 276,902
Int. Cl. B66c *23/06, 23/62*
U.S. Cl. 212—59 R **6 Claims**



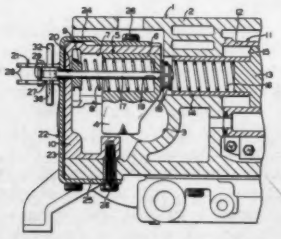
A lift and tow truck assembly having a bed and an upright support and a boom support block, with an elongated boom assembly swivelly mounted upon said block for universal adjustment. A head assembly mounting plate upon the free end of the boom assembly mounts a head assembly which includes a sheave for a load line. The load line sheave assembly is mounted upon the upright support and is connected to a winch assembly on the bed. A pair of rearwardly converging telescoping boom side supports at their one ends are pivotally connected to the boom support block for rotation on a horizontal axis with their other ends secured to the head assembly mounting plate. A head support assembly is connected to the head assembly and includes a block and tackle and suspension cable and is adapted for powered raising and lowering of the boom.

3,780,879

MANUAL LATCH RETRIEVER APPARATUS FOR CAR UNCOUPLER

Raymond C. Wright, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 25, 1972, Ser. No. 220,577
Int. Cl. B61g *3/26*
U.S. Cl. 213—159 **10 Claims**



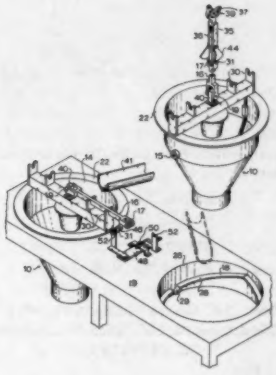
A manual latch retriever for use with automatic railway car couplers of the type wherein a latch member, upon coupling operation, is biased into engagement with a coupling pin for locking the coupler mating heads in a coupled relation, and wherein power operated means are employed for disengaging the latch member for permitting uncoupling of the cars, said latch retriever comprising manually operable lever means connected to said latch member and extending externally of the casing so as to be accessible for manual manipulation in withdrawing and disengaging the latch member from the coupling pin in the event of failure of the power operated means.

3,780,880

CRANE BUCKET EQUIPMENT

William A. Perry, 270 Cassandra Blvd., Apt. 409, Don Mills, Ontario, and Raymond O. Jobst, 1476 Trotwood Ave., Mississauga, Ontario, both of Canada

Filed Sept. 7, 1971, Ser. No. 178,005
Int. Cl. B67c *3/34*
U.S. Cl. 214—1 R **4 Claims**



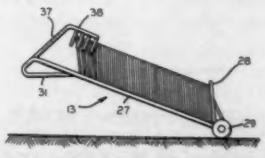
A holder with a capacity for two crane buckets holds one of these buckets for filling while the other is being emptied. On return of the emptied bucket to the holder a mechanism is equipped to detach the emptied bucket from the crane cable and to attach the filled bucket to the crane cable. The crane bucket is designed so that its weight operates hydraulic means for causing bottom opening and closing.

3,780,881

MOBILE STRUCTURE FOR HANDLING FLAT ARTICLES

James J. Friel, Miami, Fla., assignor to Container Corporation of America, Chicago, Ill.

Division of Ser. No. 196,482, Nov., 1971. This application Feb. 14, 1973, Ser. No. 332,257
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 QE **2 Claims**



The structure referred to finds particular use with a machine for feeding paperboard blanks to a carton forming machine, for example.

3,780,882

PLATE TURN-OVER MECHANISM

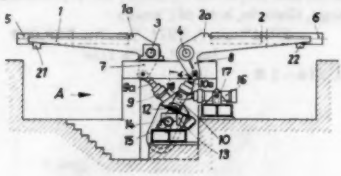
Ruprecht Wagner, Scheidt/Saar, Germany, assignor to Moeller & Nuemann GmbH, Ingbert/Saar, Germany

Filed Dec. 14, 1972, Ser. No. 315,182

Claims priority, application Germany, Dec. 16, 1971, P 21 62 384.7

Int. Cl. B65g 7/00

U.S. Cl. 214—1 QA **3 Claims**



A hydraulically driven plate turn-over mechanism enabling inspection of both sides of rolled plates. The mechanism has two groups of turning arms which are independently pivotal by hydraulic actuators. The actuators are pivotally secured to a rocker which is pivotal about a hydraulic axis by means of a further actuator.

3,780,883

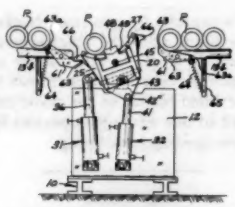
PIPE HANDLING SYSTEM FOR USE IN WELL DRILLING

Cicero C. Brown, c/o Brown Oil Tools, Inc., P.O. Box 19236, Houston, Tex.

Division of Ser. No. 125,740, March 18, 1971, Pat. No. 3,706,347. This application July 25, 1972, Ser. No. 275,024

Int. Cl. E21b 19/14

U.S. Cl. 214—2.5 **4 Claims**



A pipe handling system for use in well drilling. The system includes pipe storage racks, power-operated conveyor means for advancing the pipe sections to a drilling derrick and for transferring the pipe sections from the storage racks to the conveyor means; power swivel means supported by the derrick hoist adapted for connection to the pipe sections, and power-actuated pivoting means connecting the power swivel means to the hoist to enable angular movement of the swivel means as required to effect alignment thereof with the forward ends of the pipe sections entering the derrick from the conveyor means.

3,780,884

ARTICLE TRANSFER DEVICE

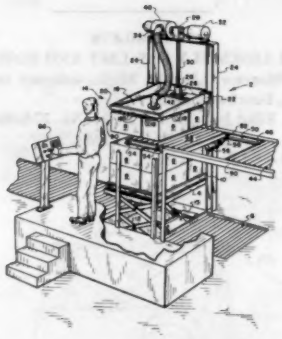
Robert Keith Jones, Salt Lake City, Utah, assignor to Kenway Engineering, Incorporated, Woods Cross, Utah

Filed Apr. 3, 1972, Ser. No. 240,565

Int. Cl. B65g 59/04

U.S. Cl. 214—8.5 D **2 Claims**

An article transfer device comprising a first conveyor, a platform positioned to permit transfer of articles between said platform and said first conveyor, a vacuum manifold mounted above said platform, a plurality of vacuum cups depending from said manifold and each having a bore communicating the gripping surface thereof with said manifold, elevating means for raising and lowering said platform into and out of a position to cause articles carried by said platform to engage at least one of said vacuum cups, a shuttle extendable to a position underlying said vacuum cups and retractable to a position removed from said vacuum cups, and a second conveyor positioned to permit transfer of articles between said shuttle and said second conveyor.



3,780,885

DEVICE FOR PLACING CUPS ON A MOVING CARRIER MEMBER

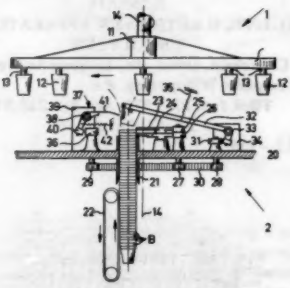
Humphrey Alphons Victor Van Der Roer, Freiburg, Switzerland, assignor to Polytype AG., Freiburg, Switzerland

Filed Aug. 31, 1972, Ser. No. 285,455

Claims priority, application Switzerland, Sept. 9, 1971, 013208/71

Int. Cl. B65g 59/10

U.S. Cl. 214—8.5 A **11 Claims**



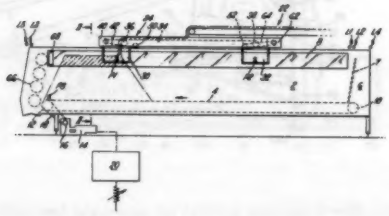
In transferring cups from a stationary stack of nested cups to a moving carrier member, such as a mandrel shaped to conform to the interior of the cup, a pair of pivotally mounted arms with releasable gripping members at their ends pick-up cups singly, and under a spring action, swing the cups through an arc into the path of the carrier member. As each cup is swung toward the carrier member, the plane of its opening assumes an oblique angular orientation relative to the axis of the carrier member so that the carrier member enters the cup opening and removes the cup from the gripping members. In addition, another pivotally mounted spring biased member follows the movement of the cup and urges it onto the carrier member after the cup has been displaced from the gripping member.

3,780,886

FEEDING OF TOBACCO AND OTHER MATERIALS

Edward James Allen, Southampton, England, assignor to W. H. Dickinson Engineering Limited

Filed Feb. 14, 1972, Ser. No. 226,164
Int. Cl. B65g 65/30
U.S. Cl. 214—17 CA 13 Claims



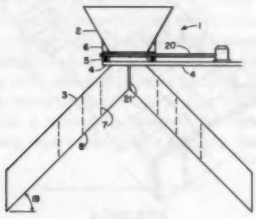
Apparatus for feeding especially tobacco comprises a silo which has a floor formed by a conveyor for carrying a mass of material in the silo towards a discharge end of the silo, and includes an infeed device which is arranged to move continuously along the conveyor in a controlled oscillatory motion having a mean position which, while the conveyor is stationary, moves from one end of the silo towards the other.

3,780,887

ROTARY DISTRIBUTOR MEANS AND METHOD

Garrell C. Bottoms, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Oct. 10, 1972, Ser. No. 296,506
Int. Cl. B65g 65/32
U.S. Cl. 214—17 CB 8 Claims



A rotary distributor apparatus with inclined conduits, stream dividers and multiple discharge ports and method are provided for uniformly distributing particulate material in a vessel for subsequent processing.

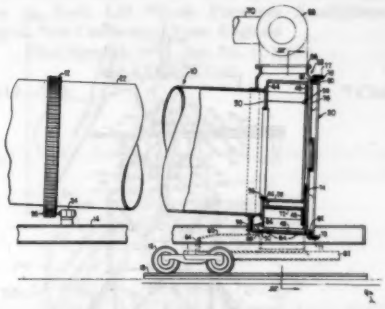
3,780,888

MATERIAL TRANSFER APPARATUS FOR A ROTARY DRUM

Erwin Hoffman, Essen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 7, 1971, Ser. No. 187,404
Claims priority, application Germany, Oct. 22, 1970, P 20 51 907.7
Int. Cl. B66c 17/08
U.S. Cl. 214—18 K 8 Claims

A rotary drum is employed to quench the coke discharged from a coke oven and thereafter transfer the quenched coke to a fixed conveying device. The quenched coke is discharged onto the conveying device from the rotary drum through transfer apparatus that effectively seals the outlet of the rotary drum and collects the steam and dust formed during the quenching operation within the rotary drum through a second outlet suitably connected to air cleaner apparatus. The transfer apparatus includes a plurality of paddles connected to and rotatable with the rotary drum. The paddles are positioned within a fixed end housing and form pockets therebetween to convey upon rotation of the drum



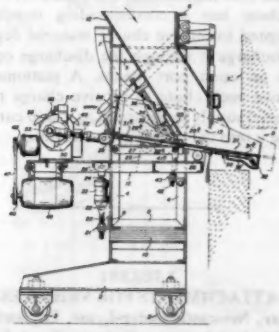
preselected quantities of quenched coke up a fixed arcuate plate to a discharge chute. A fixed arcuate sealing segment is positioned in spaced overlying relation with the arcuate plate and has sufficient length to overlie and enclose at least one pocket on opposite sides of the discharge chute. The upper portion of the arcuate plate forms a distributor to feed the quenched coke discharged from the rotary drum into the pockets formed by the paddles. The arcuate plate and arcuate sealing segment are connected to a fixed housing and are movable linearly to compensate for expansion and contraction of the rotary drum.

3,780,889

GLASS BATCH FEEDER

John Earl Frazier, and Clifford F. Crouse, both of Washington, Pa., assignors to Frazier-Simplex, Inc., Washington, Pa.

Filed Nov. 9, 1971, Ser. No. 197,007
Int. Cl. C03b 3/00
U.S. Cl. 214—33 15 Claims



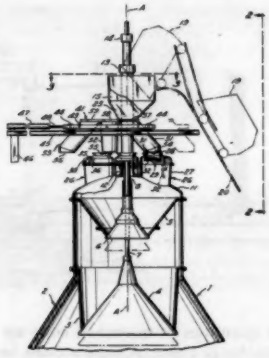
There is disclosed a blanket type batch feeder for a glass melting furnace having one or more charger plates supported in such a manner that the angle of slope of the charger plate may be adjusted about an axis that substantially coincides with the lower edge of the sand seal at the rear of the supply chute. Also the charger plate may be swiveled about an axis normal to its surface to change its angle with respect to the longitudinal axis of the furnace which it feeds.

3,780,890

FURNACE CHARGING APPARATUS

Warren E. Glover, Lakewood, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio

Filed Mar. 1, 1972, Ser. No. 230,606
Int. Cl. F27b *5/12*
U.S. Cl. 214—36 **27 Claims**



An apparatus for charging particulate burden material into a shaft furnace, such as a blast furnace, having a generally vertical axis. Several individual port means are spaced around the axis and mounted on the upper portion of the furnace above two superposed furnace bells in superposed stationary hoppers. Each of the port means has an upwardly open mouth, and individual valve means for closing the port means gas tight and for opening it independently of other port means so it can provide a flow of material into the furnace. Two externally supported non-rotatable independently laterally reciprocable chutes are mounted above the port means. Each chute has a plurality of lower discharge openings each of which is positionable over and alignable with the mouth of selected port means by proper reciprocable movement of the chute, to discharge material into the mouth so that material will pass from the chute into the furnace when the port means is open; and each chute has a corresponding number of upper openings adapted to receive charge material deposited in the chute and discharge it through the discharge opening that is aligned with an open port means. A stationary hopper is mounted above each chute to receive charge material from suitable material supply means such as a skip car or conveyor, and discharge it into the proper chute opening.

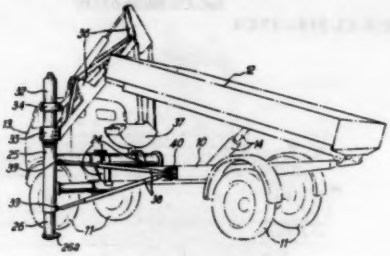
3,780,891

ATTACHMENTS FOR VEHICLES

Hubert Steiner, Newcastle-under-Lyme, England, assignor to H. Steiner Limited, Longton, Stoke-on-Trent, England

Filed Sept. 15, 1971, Ser. No. 180,586
Claims priority, application Great Britain, Sept. 26, 1970, 45,926/70
Int. Cl. B66f *9/00*
U.S. Cl. 214—138 C **4 Claims**

An attachment for a vehicle such as a truck and comprising a frame structure for mounting behind the driver's cabin and which can be extended to one side of the vehicle, a vertical post mounted at the outer end of the frame structure and having a retractible foot portion for engagement with the ground, the post serving to mount an excavator bucket or like attachment and being rotatable about its axis and tiltable in the plane of the frame structure.

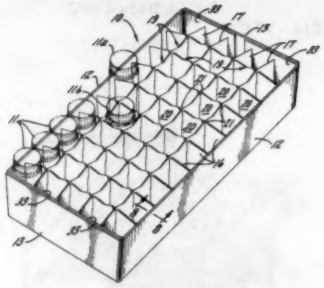


3,780,892

METHOD OF TRANSFERRING SAMPLE VIALS TO AND FROM VIAL-CARRYING TRAYS

Edmund Frank, Chicago, Ill., assignor to Packard Instrument Company, Inc., Downers, Ill.

Division of Ser. No. 27,405, April 10, 1970, abandoned. This application Mar. 27, 1972, Ser. No. 238,125
Int. Cl. B65g *65/00*
U.S. Cl. 214—152 **1 Claim**



A disposable tray for holding sample vials and the like is provided, by means of which sample vials may be easily handled by automatic equipment. Loading of vials into vial holding compartments in the tray is facilitated by the provision of regular V-shaped notches along the upper edges of compartment-defining partitions. These notches cause any slightly misalined vial, upon its descent into the tray, to be cammed into the appropriate vial-holding compartment. Vial loading is further facilitated by the outer tray sides, which are formed so as to slant slightly toward the tray interior, thereby assisting in camming outer rows and columns of vials into the appropriate compartments. To provide compartments which may be accurately located under the descending vials, the partitions are rigidly secured to each other and to the tray sides. Tray rigidity is enhanced by tabs formed on opposite sides of the tray blank, which tabs are secured, upon tray formation, to the abutting tray sides. Removal of vials from the tray is made possible by the provision of a hole in each compartment bottom, through which may be inserted the tine of a vial-ejecting comb.

3,780,893

METHOD OF LOADING CONTAINERS WITH CARGO

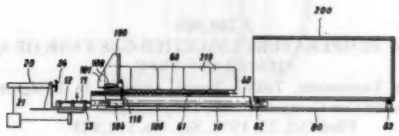
Harry Lassig, and Anton Grosshauser, both of Hamburg-Schenefeld, Germany, assignors to Fordertechnische Forschungsgesellschaft mbH, Holstenplatz, Hamburg-Schenefeld, Germany

Filed Apr. 25, 1972, Ser. No. 247,287

Claims priority, application Germany, Feb. 5, 1972, P 22 05 505.6

Int. Cl. B65g 67/04

U.S. Cl. 214—152 1 Claim



Method and apparatus for loading containers with cargo or for the compound stacking and setting down such cargo compounds on a loading platform of a transport vehicle or in a storage area in a warehouse a.s.o. The method comprises the steps of arranging the cargo in a predetermined manner by arranging the cargo in cargo units of a unit length corresponding substantially to the width of an available cargo space or cargo area, transferring such cargo units onto a hoisting track , hoisting the cargo units thereon up to the elevation of a conveying carriage, assembling a plurality of such cargo units on the conveying carriage in thereby forming a cargo compound of a length, width and height corresponding f.e. substantially to the internal cargo space dimensions of a container whereby the cargo units are moved through a contour sensing gate frame having gate wings which gate monitors the width and alignment of the cargo units being transferred onto the conveying carriage, driving the conveying carriage with the cargo compound assembled thereon into a cargo receiving area such as the internal cargo space of a container, moving the gate frame into a position adjacent the cargo receiving area, closing the gate wings on the gate frame and withdrawing the conveying carriage from the cargo receiving area whereby the gate wings serve as abutments and allow, during the reverse movement of the conveying carriage, to push the cargo compound off the conveying carriage so that the cargo will be put down on the cargo receiving area. The apparatus consists essentially of a base, a track, a conveying carriage, a gate frame, control and drive means and a mounting support for a container. Optionally a hoisting roller train and a feeding conveyor may be provided.

3,780,894

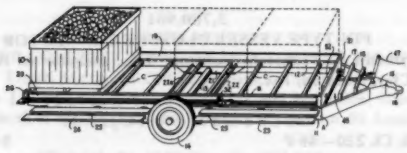
TRAILER

James C. Holmes, and Fred M. Holmes, both of Johnston, S.C.

Filed Sept. 8, 1969, Ser. No. 856,222

Int. Cl. B60p 1/24, 1/52

U.S. Cl. 214—505 2 Claims



A trailer for transporting bulk boxes loaded with fruit from the field and the like, to a remote location. The trailer is provided with a flat bed which is pivotally carried on an axle so that such can be pivoted to an unloading position. The flat bed is weighted so that when such is loaded with bulk boxes it will pivot to the unloaded position, and when the bulk boxes are unloaded therefrom the flat bed will automatically return to the horizontal position. A retaining member is carried adjacent the rear end of the flat bed for preventing the bulk boxes from rolling off the bed. Means are provided for automatically lowering the retaining member out of the path of the bulk boxes as the flat bed pivots to the unloaded position.

3,780,895

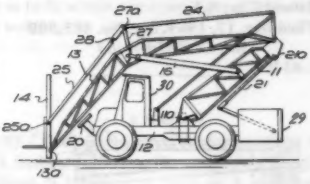
LOAD HANDLING VEHICLE

Matthew Teasdale Campbell, Newcastle upon Tyne, England, assignor to Fork Lift Truck Patentees Establishment, Lemington, New Castle upon Tyne, England

Filed May 14, 1971, Ser. No. 143,339

Int. Cl. E02f 3/00

U.S. Cl. 214—770 7 Claims



A load handling vehicle has load raising means comprising a box-section mast pivotally mounted on the vehicle chassis between its front and rear wheel units for displacement between a rearwardly extending generally horizontal position and a generally erect position, a cranked boom having one end pivotally connected to the free end of said mast and its other end adapted to receive a load carrying member such as a fork lift mast, a first operating means for effecting displacement of said mast and a second operating means for effecting angular displacement of the boom relative to said mast.

3,780,896

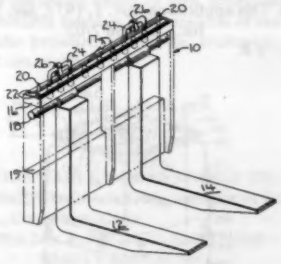
LIFT TRUCK FORK RETAINING PINS

John T. Crawford, Lyndhurst, Ohio, assignor to Towmotor Corp., Cleveland, Ohio

Filed Feb. 14, 1972, Ser. No. 225,811

Int. Cl. B66f 9/06

U.S. Cl. 214—731 3 Claims



A lift truck fork carriage construction is provided with fork positioning retainers that are securely mounted on the carriage structure whereby said retainers cannot be jolted off or misplaced from the fork carriage during lift truck operations.

3,780,897

STOPPERS

Victor Wassilieff, 84, rue de l'Assomption, Paris, France

Filed Feb. 8, 1971, Ser. No. 113,244

Claims priority, application France, Feb. 18, 1970, 7005737; Apr. 7, 1970, 7012464

Int. Cl. B65d *41/22, 41/20*

U.S. Cl. 215—41 12 Claims

A container closure has a body, transverse closure means, a liquid-tight element having an annular face designed to place itself below and facing a non-cylindrical annular area of a container neck, and means capable of resilient deformation resting on the end face of the neck, so as to exert an axial traction on the body and to maintain the said annular face and area in mutual contact.

The closure may be formed from a one piece blank.

3,780,898

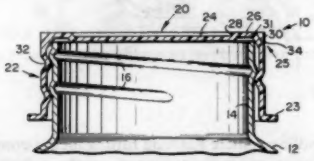
SCREW CAP CLOSURE

Gary G. Menkel, Holliswood, N.Y., assignor to Design Center, Inc., Long Island City, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,900

Int. Cl. B65d *41/04*

U.S. Cl. 215—43 R 9 Claims



A screw type cap for containers is provided which is adapted to engage the sealing edge or the top of the neck of a container. The cap is formed with an annular groove about the periphery of the central portion of the top. The groove opens downwardly to receive and sealingly engage the sealing edge of the container. An internal liner may be inserted in the cap to improve the seal particularly when the cap is to be used to seal bottles whose top sealing edge is not uniformly normal to the longitudinal axis of the neck. The liner engages the sealing edge and is deflected upwardly with the internal groove receiving the deflected portion of the liner and maintaining it in sealing engagement with the sealing edge.

3,780,899

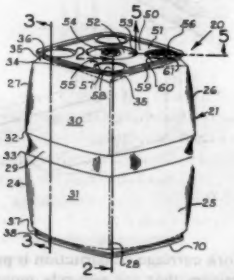
CONTAINER WITH CONCAVE BELT AND LOCK SEAM

Ralph E. Roper, Indianapolis, Ind., assignor to Wallace Expanding Machines, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 101,792, Dec. 28, 1970, abandoned. This application Nov. 1, 1971, Ser. No. 195,583

Int. Cl. B65d *7/02*

U.S. Cl. 220—5 R 11 Claims



A container having a rectangular tubular body section sealingly joined to a top and bottom panel by curled lock seams. The tubular body has an upper and lower portion integrally joined together by a center concave smooth and rounded belt. The top and bottom panels are secured to the tubular body by means of curled lock seams. The containers are adapted to stack one upon another by means of the complementary configuration of the top and bottom panels. A V-shaped recess is located immediately adjacent each lock seam extending around the periphery of the top and bottom panels adding to the strength of the container.

3,780,900

LOW TEMPERATURE LIQUEFIED GAS TANK OF A MEMBRANE TYPE

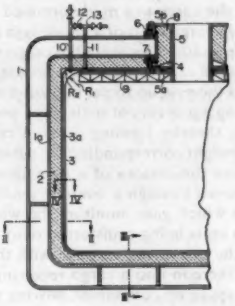
Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company, Ltd., Tokyo, Japan

Filed Oct. 22, 1971, Ser. No. 191,945

Claims priority, application Japan, Nov. 10, 1970, 45/98488

Int. Cl. B65d *25/18*

U.S. Cl. 220—9 LG 7 Claims



A tank of membrane type for containing low temperature liquefied gases such as petroleum gases, comprising an outer vessel of a rigid structure, an inner vessel made of a membrane or thin sheet for containing low temperature liquefied gases, and a heat insulating intermediate layer disposed between the outer and inner vessels, wherein the improvement resides in that a secondary inner vessel made of a membrane or thin sheet is provided between the heat insulating intermediate layer and the first mentioned or primary inner vessel as a secondary barrier wall which prevents the liquefied gases which may leak out of the primary inner vessel due to breakage thereof from affecting the heat insulating intermediate layer and the outer vessel.

3,780,901

PIN-TYPE VESSEL CLOSURE CONNECTOR

Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Houston, Tex.

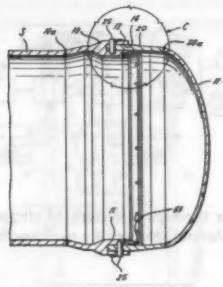
Filed Jan. 14, 1972, Ser. No. 217,827

Int. Cl. B65d *53/00*; A47j *27/08*

U.S. Cl. 220—46 P 5 Claims

A pin-type vessel closure connector for connecting a vessel head or closure to a vessel shell or cylinder, wherein the connector includes an annular yoke welded to one part of the vessel, preferably the shell, and an annular connector finger on another part of the vessel, preferably the head, which yoke and finger are interfitting and are joined together by a plurali-

ty of circumferentially disposed releasable connector pins, and wherein a rocking seal is provided for sealing between the



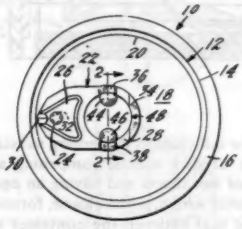
innermost ring of the yoke and the finger to maintain the seal during flexing thereof in response to varying pressures in the vessel.

3,780,902

CONTAINER END CLOSURE

Henry Sylvester Holc, Barrington, and Burton Frank Pillnik, Cary, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 17, 1972, Ser. No. 244,777
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **15 Claims**



In a container subjected to internal pressure, a metallic end closure is provided having a central panel portion, a removable portion defined by a score line included in the central panel portion, and an opening tab attached to the removable portion proximate the periphery of the central panel portion, the pull ring or handle of the opening tab being radially inward from the point of attachment of the opening tab to the removable portion. The end closure is additionally provided with means on said central panel portion for releasably holding said opening tab substantially flat against said central panel portion when the central panel portion bulges outwardly due to the internal pressure of the container.

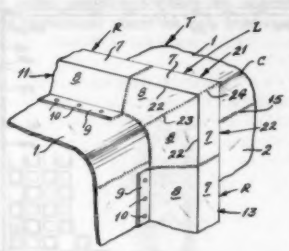
3,780,903

CORNER CONSTRUCTION FOR REINFORCING RIB ON TANK MADE FROM THIN SHEET METAL

Edward J. Clarkin, Florissant, and George D. Conlee, Glendale, both of Mo., assignors to Nooter Corporation, St. Louis, Mo.

Filed July 24, 1972, Ser. No. 274,322
Int. Cl. B65d *7/42*
U.S. Cl. 220—71 **9 Claims**

The corner between adjacent ends of reinforcing ribs on adjacent walls of a tank is fabricated from two outer members which are assembled as a unit. The corner unit is then connected between the ribs on the adjacent angularly positioned walls by welding it into place to form the complete corner.



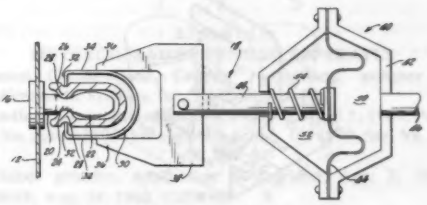
One of the ends of an outer member is preferably offset inwardly so as to fit within one cooperating rib for ease in assembling and welding.

3,780,904

PRESSURE COMPENSATING DOOR CATCH ASSEMBLY

Charles O. Stanford, Herrin, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Sept. 23, 1971, Ser. No. 183,042
Int. Cl. B65d *45/00*
U.S. Cl. 220—55.3 **6 Claims**



A pressure compensating door catch assembly for the door to a pressurized enclosure is provided. The assembly includes a strike affixed to the door, a catch affixed to the enclosure and a catch spring which exerts a biasing force on the catch. The force of the catch spring is determined by the bending moment arm of the spring which, in turn, is determined by the position of a shiftable fulcrum. The position of the fulcrum is governed by the pressure within the enclosure through a diaphragm and connecting rod.

3,780,905

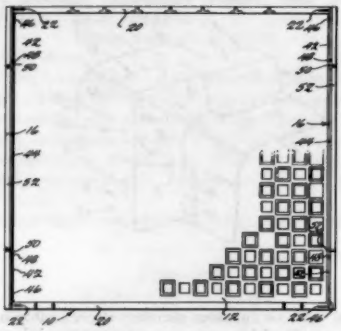
90° STACKABLE AND NESTABLE TRAY

Ralph H. Herolzer, Cincinnati, Ohio, assignor to Vanguard Industries, Inc., Cincinnati, Ohio

Filed Jan. 5, 1972, Ser. No. 215,528
Int. Cl. B65d *21/04*
U.S. Cl. 220—97 D **5 Claims**

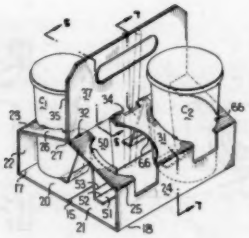
A 90° stackable and nestable tray for bakery products or the like having inner and outer stacking rails along the lower edge of the end walls thereof centrally recessed to define floor engaging structures on opposite sides thereof operable to support the tray on a floor or the like to permit end wall entry of a hand truck, the floor engaging structures further defining

pockets corresponding in shape to upper stacking rail portions along the upper edge of the end walls to thereby render the



tray operable to be slidably supported on a like tray for movement into stably stacked relation thereon.

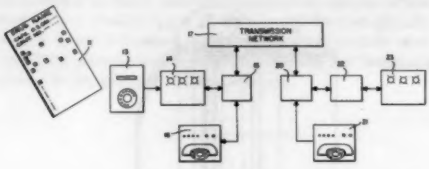
3,780,906
CUP CARRIER
James H. Katzenmeyer, Elkhart, Ind., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,705
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 **15 Claims**



This disclosure relates to a carrier having a plurality of openings formed in a top wall thereof for receiving a plurality of drinking cups or the like therein. A tab extends into each of the openings and is adapted to engage a container of a predetermined size positioned therein. Transversely adjacent openings each include a partition which is provided with fold lines for automatically varying the distance between each partition panel and its adjacent side panel to accommodate articles of different sizes at the bottoms thereof.

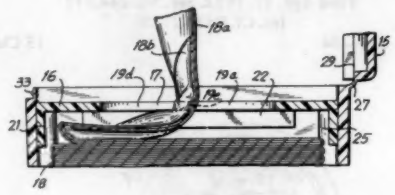
3,780,907
SYSTEM FOR REMOTE CONTROL OF PACKAGE-DISPENSING STATION
Walter E. Colburn, Drexel Hill; Howard M. Trowern, Jr., Malvern, and Franklin W. Kerfoot, Jr., Newtown Square, all of Pa., assignors to Parke, Davis & Company, Detroit, Mich.
Filed Oct. 3, 1969, Ser. No. 863,641
Int. Cl. E04h *11/00*
U.S. Cl. 221—2 **4 Claims**

A system for the remote control of a plurality of package-dispensing units is disclosed, wherein a data card and card dialer cooperate with a control station interface unit to transmit data across a telephone system network to a receiving station, where the data is operated on by a receiving station interface unit which selects and operates a designated package-dispensing unit, and sends a return signal to the control station. The receiving station interface unit logically operates on



the received data through a system of stepper switches and relays, causing solenoid release of a package from the selected dispensing unit.

3,780,908
BULK PACKAGE FOR INDIVIDUAL DISPENSING OF SUBSTANTIALLY WET SHEETS FROM STACKS
William E. Fitzpatrick, Wyckoff; Leonard Berger, Ridgewood, and Hayward B. Auerbach, Maywood, all of N.J., assignors to International Playtex Corporation, New York, N.Y.
Filed July 28, 1972, Ser. No. 274,134
Int. Cl. A47k *10/42*
U.S. Cl. 221—48 **9 Claims**

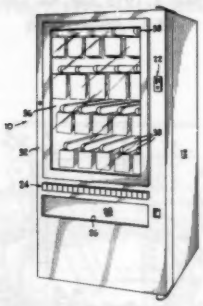


A bulk package for individually dispensing substantially wet sheets from a stack of such sheets, comprising a container receiving the stack of wet sheets and having an openable and readily resealable cover which, when closed, forms a substantially moisture-proof seal between the container and the atmosphere; and a barrier member overlying the stack of wet sheets and interposed between the stack and the cover and having a restricting opening whose proximate surfaces frictionally engage the adjacent surfaces of the successive sheets withdrawn from the stack such that when the uppermost sheet is pulled outwardly of the package through such opening the leading surfaces of the next succeeding sheet are drawn by and in contact with the uppermost sheet through the opening into frictional contact with the surfaces proximate thereto which produce a frictional force on the next succeeding sheet sufficient to overcome the force resisting separation of the two sheets yet not so large that the force required to remove the uppermost sheet will tear either of such sheets. The surfaces proximate the sheet restricting opening thus effect separation of the sheets with the leading surfaces of the next succeeding sheet extending outwardly of the opening positioned for subsequent manual grasping and removal from the package.

3,780,909
VENDING MACHINE
William H. Callahan, and Stephen I. Horvath, both of Aurora, Ill., assignors to Lektro-Vend Corp., Aurora, Ill.
Filed Aug. 4, 1971, Ser. No. 168,843
Int. Cl. G07f *11/00*
U.S. Cl. 221—85 **6 Claims**

A vending machine for vending packaged products having a product compartment, a plurality of delivery arms located in

the product compartment, each including a movable endless chain having a plurality of pairs of package retention elements, the elements of each pair coacting to releasably retain an individual package to be vended.



3,780,910

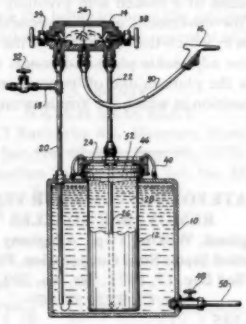
PRESSURIZED LIQUID MIXER AND DISPENSER

William Wagner, c/o Watsco, Inc., 1800 W. Fourth Ave., Miami Beach, Fla.

Filed May 11, 1972, Ser. No. 252,262

Int. Cl. B65d *35/28*

U.S. Cl. 222—95 **3 Claims**



A pressurized liquid mixer and dispenser, comprising a tank connected to a pressurized water source, a collapsible container in said tank containing a liquid other than water, a mixing chamber connected to said pressurized water source and said collapsible container, and a spray gun connected to said mixing chamber, whereby the water pressure in the tank expresses the liquid from the collapsible container and causes it to flow into the mixing chamber, where it is mixed with pressurized water and then dispensed through the spray gun.

3,780,911

DISPENSING APPARATUS FOR COLLAPSIBLE TUBE CONTAINER

David L. Paige, 1682 Newfield Rd., Columbus, Ohio

Filed Jan. 3, 1972, Ser. No. 215,012

Int. Cl. B65d *35/28*

U.S. Cl. 222—101 **8 Claims**

A dispensing apparatus for ejecting paste-form substances from a collapsible-tube container is provided having a pair of interfitting, elongated channels assembled to receive a collapsible tube and permit relative limited compressive movement of the two channels. One channel is provided with an end wall for cooperatively engaging an end of the collapsible tube and restraining the tube against longitudinal movement in one direction. A roller positioned within the assembled channels for revolving movement about an axis transverse to the longitudinal axis of the channels is operated on by one of the channels to compress the collapsible tube disposed between the roller and the other channel. This compression expells the contents of the collapsible tube container with the relative movement of the two channels being limited to that for ejecting a predetermined quantity of the contents.

3,780,912

METERING AND DISPENSING APPARATUS

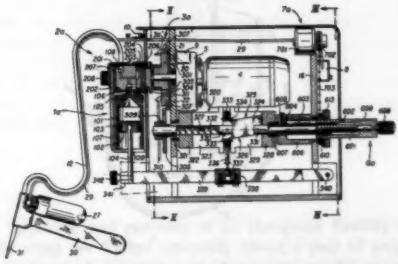
Manuel Claude Sanz, Geneva, Switzerland, assignor to Micromedic Systems, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 812,177, April 1, 1969, Pat. No. 3,669,319. This application Aug. 19, 1970, Ser. No. 27,289

Claims priority, application Switzerland, Apr. 2, 1968, 4868/68; Aug. 19, 1968, 12496/68

Int. Cl. G01f *11/06*

U.S. Cl. 222—282 **20 Claims**

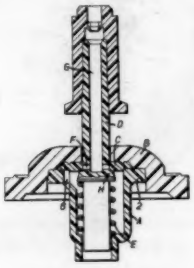


A metering and dispensing apparatus with a pump having intake and discharge strokes coupled to a switching valve which cylindrically connects the pump in open communication with a first, then a second port with an idling pause between the conditions. A mechanism converting rotary motion to sinusoidal reciprocating motion actuates the pump piston, the length of stroke of the piston being selectively adjustable within the motion conversion mechanism in accordance with an indicator indicative of the desired volume.

3,780,913
AEROSOL VALVES

William Edward Warren, Cuffley, England, assignor to Bespak Industries Limited, Hertfordshire, England

Filed Sept. 23, 1971, Ser. No. 183,148
Claims priority, application Great Britain, Sept. 30, 1970, 46,505/70
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.24 2 Claims

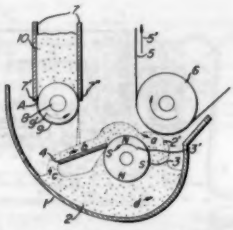


A moulded valve cup for an aerosol valve assembly which includes means for connecting the interior of the cup to the exterior thereof, the means comprising a flange at the upper end of the cup, a counter bore within the cup substantially equal to the thickness of the flange and an aperture extending through the flange in a direction parallel with the main axis of the cup and opening radially inwardly to the periphery of the counterbore over the full thickness of the flange. This construction avoids moulding problems of the prior art wherein the apertures are formed by separate movable pins in the moulding tool, which are expensive and are prone to leave vestigial flashes at their junction with a central core pin.

3,780,914
DEVELOPER PARTICLE SUPPLY DEVICE

Ryunosuke Nakano, Yokohama, and Yoshiyuki Fujiyama, Hino, both of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Jan. 26, 1972, Ser. No. 220,870
Int. Cl. G01f *11/26*
U.S. Cl. 222—407 4 Claims

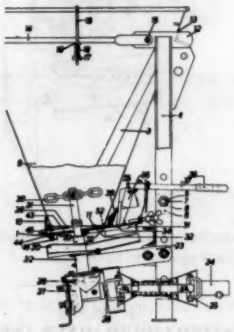


A developer particle supply device for supplying electrostatic developer particles into a developer storage chamber of an electrophotographic developing device. The supply device comprises a supply box in which the developer particles are stored and a supply roller serving as a bottom of the supply box. A space is formed between the roller and a lower end of the box to let the particles fall down therethrough. The surface of the roller is made of resilient material and a part thereof is pressed against another lower end of the box. By rotation of the roller, the particles are supplied through the space into the chamber.

3,780,915
DETACHABLE MOUNTING OF DISPENSER MACHINE PARTS

William Thomas Teagle, Blackwater, Truro, England

Filed May 4, 1971, Ser. No. 140,037
Int. Cl. B65d *47/00*
U.S. Cl. 222—545 8 Claims

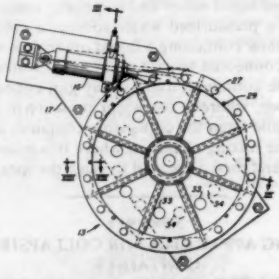


An adjustable plate for varying the size of the discharge aperture at the bottom of the hopper of a machine for broadcasting seed, fertiliser or other granular material, is supported in an aperture in a second plate, which clips onto a seat for the hopper, by means of a forked arm pivotally mounted on the second plate for movement about a vertical axis between a closed position in which the lower fork of the arm engages the underside of the adjustable plate and coacts with a pin on the latter to retain the plate in one of its positions of adjustment, and an open position in which the arm is swung clear of the adjustable plate.

3,780,916
ROTARY GATE FOR BOTTOM POUR VESSEL HAVING REMOVABLE NOZZLES

James T. Shapland, Wilkins Twp., Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1971, Ser. No. 209,034
Int. Cl. B22d *37/00*
U.S. Cl. 222—555 6 Claims



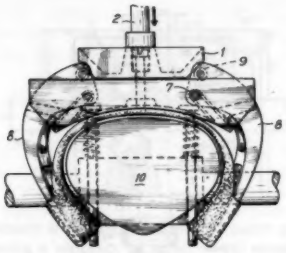
A rotary gate for a bottom-pour vessel has a plurality of removable and interchangeable refractory inserts, at least one of which has a nozzle opening therethrough. The inserts can be removed or replaced at any time they are not in the active position.

3,780,917

MACHINE HAVING GRIPPERS FOR SHAPING, FOLDING AND PRESSING COLLARS

Gunther Rosner, Sao Paulo, Brazil, assignor to G. Rosner & CIA LTDA, Sao Paulo, Brazil

Filed Feb. 7, 1972, Ser. No. 224,204
Int. Cl. A41h *43/00*
U.S. Cl. 223—2 2 Claims



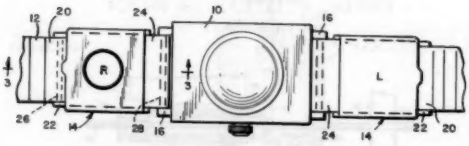
A machine to be used in the treatment of shirt collars. The machine has a stationary head against which a collar is to be placed during treatment thereof. A pair of elongated grippers are symmetrically arranged with respect to the latter head, and the head is situated between these grippers. A support structure supports the grippers for swinging movement toward and away from the head, while a suitable drive coacts with the grippers for simultaneously moving them toward and away from the head, a fluid-pressure unit coacting with the driving structure to actuate the latter to move the grippers toward and away from the head at the will of the operator of the machine.

3,780,918

WATCH BRACELET

Flora K. Curtis, 17 Barbarba Rd., Danvers, Mass.

Continuation of Ser. No. 67,043, Aug. 26, 1970, abandoned.
This application Sept. 8, 1972, Ser. No. 287,224
Int. Cl. A44c *11/00*
U.S. Cl. 224—4 H 1 Claim



A watch bracelet of articulated or continuous construction and a pair of lens receptacles connecting the ends of the bracelet to the opposite sides of a watch, each receptacle having a pocket shaped to receive a lens and a hinged closure provided with a latch member for holding it closed until it is manually opened for the purpose of removing a lens.

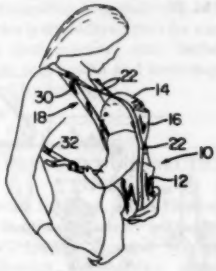
3,780,919

INFANT CARRIER

Margaret S. Hansson, Boulder, Colo., assignor to Gerico, Inc., Boulder, Colo.

Filed Jan. 19, 1972, Ser. No. 218,917
Int. Cl. A47d *13/02*
U.S. Cl. 224—6 9 Claims

A carrier for an infant child includes a fabric pouch in which the child can be seated having leg openings near its bottom end and a unique strap arrangement includes shoulder straps and reinforcing straps so connected to the pouch and to one another as to permit secure but adjustable suspension either from the front or back of the user. A head support is disposed between the open upper end of the pouch and the shoulder straps in a manner such that it can be retained in a head-supporting position or folded down into the pouch in an out-of-the-way position.

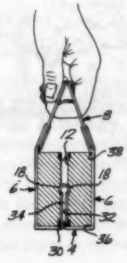


3,780,920

SKI CARRIER

Dale E. Green, 23109 56 West, Mountlake Terrace, Wash.

Filed Nov. 1, 1971, Ser. No. 194,272
Int. Cl. B65d *63/18, 69/00*
U.S. Cl. 224—49 11 Claims



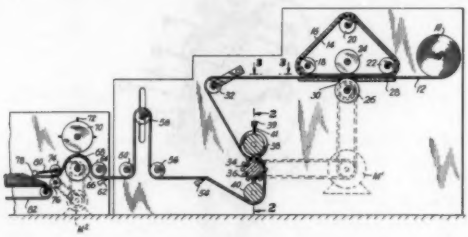
The opposing end portions of an elongated flexibly constructed strap are folded upwardly about a pair of longitudinally juxtaposed skis resting in a horizontal condition on the center portion of the strap, and a pair of handles formed on the end portions of the strap are gripped simultaneously in one hand to form a sling which, when raised, tightly corners about the skis and presses them together against a frictional interlock member that is upstanding on the center portion of the strap between the running surfaces of the skis. Moreover, to increase the frictional effect, the interlock member preferably has a pair of laterally outstanding ribs thereon which mate with the longitudinally extending grooves commonly provided in the surfaces of the skis.

3,780,921

METHOD AND APPARATUS FOR PRODUCING GANG OF SEPARABLY INTERCONNECTED ELONGATE ARTICLES

Harry J. Harp, Jenkintown, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 16, 1972, Ser. No. 263,637
Int. Cl. B26d *3/08, 9/00;* B26f *3/02*
U.S. Cl. 225—2 17 Claims



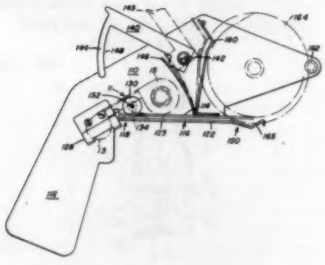
A continuous web of material is scored to delineate a plurality of separable, interconnected elongate articles each having an aperture. The apertures are used to advance the web through apparatus which comprises scoring and severing stations.

3,780,922

CARTRIDGE STRIPPER

John F. Bloemendaal, and Willis L. Stockdale, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 15, 1972, Ser. No. 234,795
Int. Cl. G03b *1/56*
U.S. Cl. 226—92 19 Claims



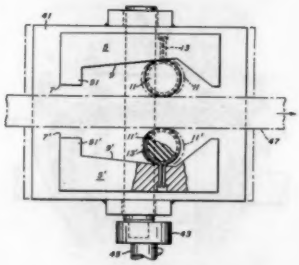
Apparatus for use in removing a strip of film from a cartridge, which film is interwound with a strip of backing material. The invention obviates the need for breaking open or otherwise mutilating the cartridge by withdrawing the backing material through the cartridge exposure aperture to, in turn, withdraw the film strip by contact with the backing material. The apparatus comprises a film guide track means and means for holding the cartridge adjacent one end of the track. A film guide means is disposed between the cartridge and the end of the track. Means is provided whereby pulling the backing paper around the film guide means and the end of the track causes the film to be withdrawn from the cartridge and to be guided into the track.

3,780,923

GRIPPING DEVICE

Anthony Merola, Pittsburgh, Pa., assignor to Amerola Products Corporation, Pittsburgh, Pa.

Division of Ser. No. 825,369, May 16, 1969, Pat. No. 3,653,708. This application Oct. 28, 1971, Ser. No. 193,599
Int. Cl. B65h *17/10*
U.S. Cl. 226—151 9 Claims



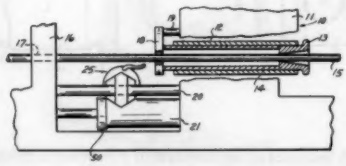
A gripping device is provided that has a pair of roller support members attached to a support means, the support members having confronting converging roller surfaces, with a resiliently secured roller on each surface in confronting relationship to the other roller. Motion of a member frictionally secured between the rollers in a direction away from the direction of convergence of the surfaces is easily achieved while any movement of the member in the direction of convergence of the surfaces causes a secure gripping of the member restraining it from such movement.

3,780,924

AUTOMATIC BAR FEEDER ATTACHMENT FOR MULTIPLE SPINDLE SCREW MACHINE

Josef Eichenhofer, Brampton, Ontario, Canada, assignor to Automatic Bar Feed Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 884,653, Dec. 12, 1969, Pat. No. 3,599,852. This application May 3, 1971, Ser. No. 139,696
Int. Cl. B65h *17/22*
U.S. Cl. 226—155 17 Claims

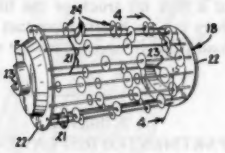


In a spindle bar machine having a hollow spindle through which a workpiece bar is cyclically advanced, a feeder formed of an elongated housing arranged transversely to the bar and rockingly mounted upon a machine shaft by a journal formed upon one end of the housing, with a motor arranged within the housing, and having a constantly rotating drive shaft extending out of the opposite end of the housing and carrying a roller arranged to periodically peripherally engage and longitudinally thrust the bar for advancing it. The housing is rocked about its journal towards and away from the bar by a housing cam follower engaging a machine. This device also includes a pneumatic push-back stop and related control equipment especially designed to fit existing multi-spindle machines.

3,780,925
RETRACTABLE WHEEL FOR PAPER GUIDING CYLINDER

Norman A. Ternes, 387 Minnesota Ave., St. Paul, Minn.

Filed Oct. 10, 1972, Ser. No. 296,116
Int. Cl. B65h 17/20
U.S. Cl. 226—191 11 Claims

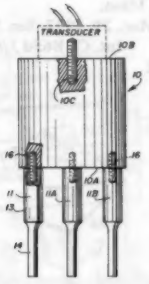


The disclosure is directed to a printed paper guiding reel or cylinder having a plurality of small wheel members defining the cylindrical paper engaging surface of the reel. Each of the wheel members is radially retractable to a position of non-engagement to permit selective positioning thereof relative to printed matter which is not yet dried. Retraction of the wheel member is effected by manual movement of the wheel relative to a supporting hub which is retainably disposed in a radial slot in the wheel. The opposite ends of the slot define positions of symmetric and eccentric rotation of the wheel. The slot is narrowed intermediate its ends to force the hub into one stable position or the other, and yielding openings are formed to permit flexure of the wheel in the area of the slot as it is moved between positions.

3,780,926
ULTRASONIC RIGID HORN ASSEMBLY

Paul H. Davis, St. Charles, Ill., assignor to Dukane Corp., St. Charles, Ill.

Filed June 2, 1972, Ser. No. 259,023
Int. Cl. B23k 5/20
U.S. Cl. 228—1 5 Claims



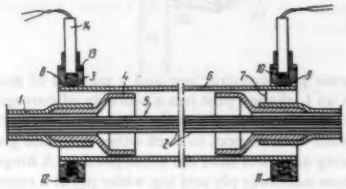
A versatile rigid horn assembly for distributing ultrasonic energy from at least one source to a plurality of spaced work areas is provided. This rigid horn assembly includes an elongated tool holder having an input region at one end and an output region at the other end. The tool holder is a horn of suitable metal and will have a length of at least one acoustical half wavelength, or any desired number of integral half wavelengths. Secured to and extending from the output end are rigid tool members, each of which is a horn and has a length of at least one acoustical half wavelength. Tool members may have lengths of integral half wavelengths, it being understood that tool members need not necessarily be of the same shape or length. The drawings illustrate various arrangements of tool members. The output end of a tool holder has means permitting attachment of a plurality of tool members, the means being arranged so that one or more various tool members may be disposed to provide different tool member patterns. The means for attaching a tool member to a tool holder includes threaded metal members each of which may be a threaded stud extending into a tapped recess in the tool holder or elongated bolts each having an enlarged head disposed in bores extending longitudinally of the tool holder and having an interiorly shouldered part for each bore.

Alternatively, a tool member may include an integral threaded boss, or the tool holder and tools may be of brazable material and secured by brazing.

3,780,927
ENVELOPE FOR EXPLOSIVE CONNECTION OF METAL PIPES

Vladimir Mikhailovich Kudinov, ulitsa Filatova, 1/22, kv. 51; Jury Petrovich Bushtedt, Bulvar Likhacheva, 3, kv. 73; Daniil Andreevich Dudko, pereulok Mechikova, 3, kv. 7; Georgy Alexandrovich Arkangelsky, ulitsa Tsitadelnaya, 94/7, kv. 22; Georgy Ivanovich Pogoretsky, ulitsa Entuziastov, 35, kv. 151; Leonid Lexandrovich Volgin, ulitsa Erevanskaya, 14, kv. 33; Viktor Anatolievich Kotov, Goloseevo, 3, kv. 7; Boris Anatolievich Surnin, ulitsa Vandy Vasilevskoi, 3, kv. 34, all of Kiev, and Ikhail Vasilievich Degtyarev, ulitsa Polotskaya, 5, korpus 2, kv. 10, Moscow, all of U.S.S.R.

Division of Ser. No. 110,001, Jan. 27, 1971. This application Jan. 24, 1973, Ser. No. 326,270
Int. Cl. B23k 21/00; B23p 3/02
U.S. Cl. 228—3 1 Claim



The connecting together of metal pipes by explosive welding, particularly metal sheaths for communication cables in which pipes of different diameters are inserted one into another, and a ring-shaped explosive charge is disposed on the outer surface of the pipe of large diameter over the location of its prospective joint with the other pipe, whereafter explosion of the charge connects the pipes together. On the outside of the charge, an inertial envelope is formed of a material, easier to deform than the metal pipes to be welded together.

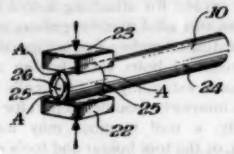
3,780,928
APPARATUS FOR STRIPPING BRITTLE WIRE INSULATION

George A. Shirn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 23, 1971, Ser. No. 211,433
Int. Cl. B23k 29/00
U.S. Cl. 228—13 3 Claims

A weld of an insulated wire to a metal contact is produced by fracturing the insulation on the wire in a limited section between a pair of opposed hard, smooth surfaces to break the adhesion of the insulation to the wire followed by removing the split insulation and welding the wire cleared of insulation to the electrical contact. The removal of the insulation and the welding of the bare wire can be incorporated in a series of automatic steps for manufacturing an electrical component.

The apparatus for removing the insulation from the wire is a pair of opposing hard, smooth surfaces carried on means for



reciprocally moving the surfaces toward and away from each other to receive, compress and then release a wire section inserted between them.

3,780,929

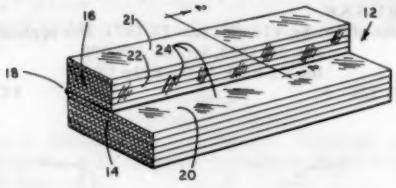
PACKAGING CONSTRUCTION

Chris C. Terrasi, Grand Rapids, Mich., assignor to Stack-Pac Corporation, Grand Rapids, Mich.

Filed June 11, 1971, Ser. No. 152,226

Int. Cl. B65d *25/12, 5/50, 5/56*

U.S. Cl. 229—14 C **3 Claims**



A corner post construction and a method of making same wherein an L-shaped post has a plurality of corrugated board plies adhesively secured together in a stack of such plies superimposed with respect to each other with one group of the stack being narrower than the other portion. A hinge connects the bottom narrower ply and top wider ply at a common edge. The abrasive inside edges of the narrower group of plies is coated with a soft, non-abrasive material to reduce the abrasive nature of the edge and to seal sawdust and dirt into the corner post edge. Other edges and surfaces which may contact articles within a package can also be coated.

3,780,930

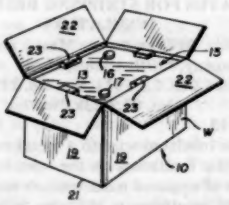
PACKAGE STRUCTURE

Anthony J. Starr, Wilmington, Del., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 31, 1972, Ser. No. 239,911

Int. Cl. B65d *5/40, 5/50, 5/60*

U.S. Cl. 229—14 BE **1 Claim**



A package structure comprises a flexible hollow article having a vertical wall with vertically extending channels therein. Vertically extending load transmitting members are disposed within the channels and extend from the bottom of the article to the top thereof and an outer wrapper made of paperboard or the like surrounds the article and the load transmitting members and is in contact therewith. The wrapper, the load transmitting members, and the flexible hollow article therein are encircled by at least one flexible strapping member to take the lateral pressures incident to flowable material confined within the article. The packaging structure may be secured to a pallet having openings at the sides thereof for the entrance of the tines of a fork lift truck or the like. The load transmitting members are in bearing contact with the pallet to transmit the load from an upper package structure to a lower one.

3,780,931

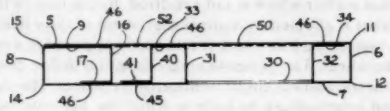
COMPARTMENTED DISPLAY CONTAINER

Wallace E. Hanson, Springfield, Mass., assignor to Champion International Corporation, Hamilton, Ohio

Filed Nov. 18, 1971, Ser. No. 199,996

Int. Cl. B65d *5/48*

U.S. Cl. 229—27 **9 Claims**



A one-piece paperboard compartmented display container is made from a T-shaped blank. The post or vertical part of the T is folded inside the container and has enough compartment-forming panels connected thereto as to divide the container into a number of compartments.

3,780,932

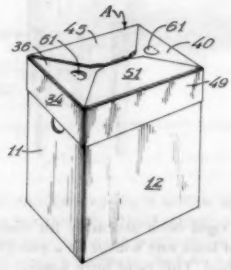
ONE PIECE RECLOSABLE CARTON

Edwin C. McLaren, Minneapolis, and Raymond Lund, Blaine, both of Minn., assignors to Hoermer-Waldorf Corporation, Ramsey County, Minn.

Filed Mar. 29, 1972, Ser. No. 239,228

Int. Cl. B65d *5/02*

U.S. Cl. 229—37 R **1 Claim**



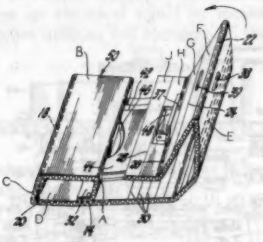
An open topped rectangular carton body is connected to a sleeve by pairs of flaps connecting the upper edges of the carton walls to the upper edges of the sleeve. In open position the flaps are substantially coplanar with the carton walls to which they are hinged. In closed position the flaps of each pair fold substantially into face contact and at right angles to the walls, closing the top of the carton body when the sleeve is telescoped onto the carton body.

3,780,933

WRAPPER FOR A SHEET METAL ARTICLE

Wayne E. Freeman, Grand Blanc, Mich., assignor to General Motors Corporation, Detriot, Mich.

Filed Apr. 12, 1972, Ser. No. 243,154
Int. Cl. B65d *65/12, 65/24, 85/54*
U.S. Cl. 229—40 4 Claims



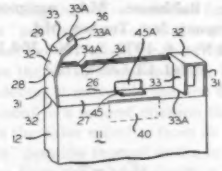
A contoured wrapper-type package for shaped sheet metal articles or irregular form, the package being formed of die-cut and scored corrugated paper to provide a tubular portion of generally rectangular cross section having an aperture for accommodating a first projection on the sheet metal article, a central portion wrapped about an outer curved surface of the sheet metal article and conforming to the shape thereof, a bridging portion composed of a double thickness of the corrugated paper and adapted to extend over the concave side of the sheet metal article and terminate adjacent to the tubular portion, and a bracing portion having an aperture for engaging a second projection on the sheet metal article at a point remote from the first projection.

3,780,934

CONTAINER WITH LOAD CARRYING FEATURE

Jeffrey M. Gardner, Moline, Ill., assignor to Container Corporation, Chicago, Ill.

Filed May 22, 1972, Ser. No. 255,407
Int. Cl. B65d *5/46*
U.S. Cl. 229—52 B Claims



A shipping container has closure elements thereof arranged and folded to define a load carrying structure, the closure elements being first arranged in a conventional closing fashion. The container is formed from a cut and scored blank of paperboard and comprises opposed pairs of main and side panels defining a tube with closure elements foldably connected to one end of the tube to provide a closure therefor. Main and side closure flaps are foldably connected to the other end of the main and side panels and are folded into overlapping relationship to define a conventional closure for the correlative end of the tube. Such main closure flaps each have a score line therein to provide a pair of closure flap portions placed in facing relationship and a second pair of closure flap portions lying in the plane of the correlative end of the tube, such arrangement of the main closure flaps being provided so that the loaded container may be carried about after opening. The side closure flaps have spaced transversely extending scores providing a vertical side portion flanking ends of those portions of the main closure flaps in facing relationship, an intermediate portion overlying the facing flap portions and a distal portion in locking engagement with the facing flap portions.

3,780,935

SERUM SEPARATING METHOD

Michel J. Lukacs, Goshen, N.Y., and Ian H. Jacoby, Franklin Lakes, N.J., assignors to Lukacs & Jacoby Associates, Goshen, N.Y.

Filed July 10, 1972, Ser. No. 270,278
Int. Cl. B01d *21/26*
U.S. Cl. 233—1 A 3 Claims

The separation of a sample of blood into serum and clot portions is accomplished by means of a sealant consisting essentially of a silicone fluid and silica dispersed therein. The separation is accomplished by inserting a device containing a supply of the sealant into a container holding a sample of the blood, the device being characterized by a nozzle portion which extends into the sample. The container and device are centrifuged so that it separates into serum and clot portions and the sealant, having a specific gravity of at least 1.026, separates the two portions.

3,780,936

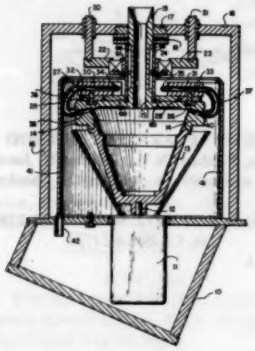
MIXER-SEPARATOR FOR AUTOMATED ANALYTICAL CHEMISTRY SYSTEM

Ian E. Bush, Plainview, L. I., N.Y., assignor to The United States of America as represented by the Secretary, Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 5, 1972, Ser. No. 215,482
Int. Cl. B04b *1/14, 11/06*
U.S. Cl. 233—20 R 13 Claims

A mixer-separator unit for use in automated analytical chemistry systems wherein two liquid phases are brought into intimate contact and then separated. The two liquids are put into a vessel where slow rotation slops them around in the ves-

sel to secure intimate mixing. Fast rotation is begun after a preset interval which results in fast and efficient centrifugal



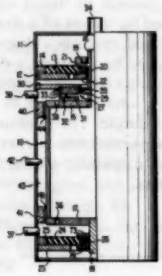
separation of the phases. After another interval tap jets are opened to withdraw the denser phase and then the lighter phase.

3,780,937

CENTRIFUGAL GAS SEPARATOR WITH ELECTRIC MOTOR DRIVE

Hisayoshi Tahara, Tokyo; Mituo Sakurai, Kawasaki, and Hayatoshi Yamada, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki-shi, Kanagawa-ken, Japan

Filed Feb. 24, 1971, Ser. No. 118,281
Claims priority, application Japan, Feb. 27, 1970, 45/16483
Int. Cl. B04b *9/02*
U.S. Cl. 233—24 **8 Claims**



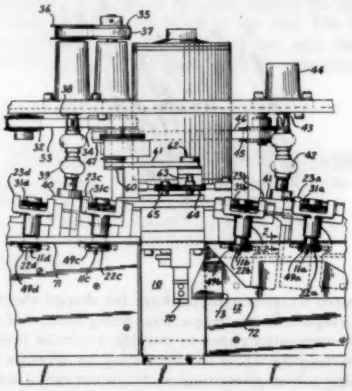
A centrifugal gas separator is disclosed which employs a vertically oriented centrifuge drum mounted on suitable bearings within a stationary housing and driven by an electric motor. The electric motor is constructed in annular form with its stator portion fixed to the stationary housing and its rotor portion fixed to the centrifuge drum and positioned generally below its stator portion. When the electric motor is energized, the magnetic attraction between its stator and rotor portions tends to lift the centrifuge drum, thereby reducing the weight supported by the bearings and reducing bearing wear. In addition, elastic or magnetic devices are alternatively provided to dampen the vibration of the rotating centrifuge drum.

3,780,938

METHOD AND APPARATUS FOR RECORDING DATA BY PERFORATING RECORD MEDIA

John E. Jones, Winnetka, and Orville T. Knutson, Antioch, both of Ill., assignors to Cummins-Allison Corp., Glenview, Ill.

Filed Jan. 31, 1972, Ser. No. 222,184
Int. Cl. G06k *1/04*
U.S. Cl. 234—1 **13 Claims**



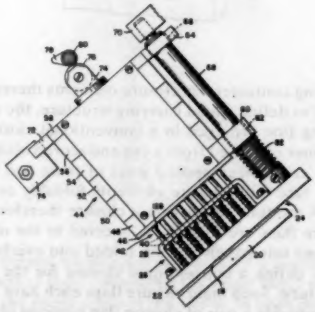
A system for perforating record media by the use of "stationary" perforating equipment, i.e., in which the punches do not move in the direction of movement of the record media. The record media is transported through the perforating equipment by frictionally engaging the surfaces of the record media with a plurality of continuously driven rollers. The continuous frictional drive applied to the record media is maintained during the perforating of the record media to obtain high throughput rates. The frictional drive rollers are skewed so as to urge the media against an inturned flange on one side of the media supporting surface. A photoelectric sensor senses the position of the record media for actuating the punches only when media is present at the perforating station.

3,780,939

SELECTIVE PUNCH

Paul E. Woodie, Baltimore, Md., assignor to American Totalisator Company, Inc., Towson, Md.

Filed Nov. 6, 1972, Ser. No. 304,195
Int. Cl. G06k *1/02*
U.S. Cl. 234—115 **8 Claims**



An apparatus for producing variable, information-bearing patterns of perforations on parking lot tickets comprises an

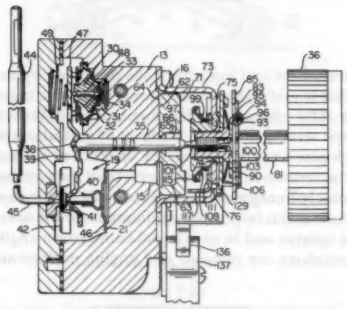
array of punches and an assembly of electrically selectable interposers which is movable as a unit whereby selected interposers operate corresponding punches. The interposers are arranged in layers, each layer of interposers being associated with a different row of punches. The interposers are guided in slots formed in individual blocks of an assembly of blocks, and are operated by solenoids mounted on circuit boards which are slidable into a mounting so that the circuit boards and interposers can be readily replaced. Maloperation of the solenoids produces an electrical signal by means of armature-operated switches utilizing foil elements on the circuit board as contacts.

3,780,940

CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 1, 1972, Ser. No. 258,798
Int. Cl. F23n *1/00*
U.S. Cl. 236—15 A **10 Claims**



A control device for interconnecting a source of fuel to a burner, the control device having a valve seat and a movable valve member for controlling the valve seat. A movable selector is carried by the control device and a clutch is adapted to interconnect the selector to the valve member, the clutch having means for moving the valve member from an "off" position to a full "on" position thereof, as the selector is moved in one direction from its "off" position to a first position thereof. The clutch keeps the valve member in the full "on" position thereof as the selector is moved in the one direction from the first position thereof to a second position thereof. The clutch thereafter moves the valve member from its full "on" position to a reduced "on" position thereof as the selector is moved in the one direction from the second position thereof to a third position thereof, the clutch being adapted to move the valve member from the reduced "on" position thereof back to the full "on" position thereof as the selector is moved in a direction opposite to the one direction from the third position thereof to the second position thereof.

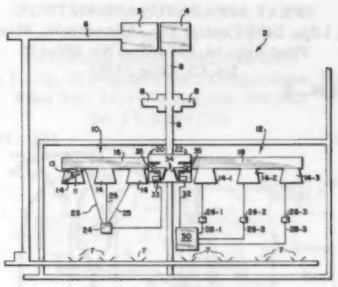
3,780,941

AIR CONDITIONING SYSTEM AND METHOD

Sam M. Blackwell, Chatham, N.J., assignor to A. I. McFarlan Company Incorporated of New Jersey, Springfield, N.J.

Filed June 29, 1972, Ser. No. 267,693
Int. Cl. G05d *7/06*
U.S. Cl. 236—49 **7 Claims**

A central air conditioning system insures acceptable operating conditions over a wide range of heat loads. Air at a controlled temperature and uniform pressure is supplied through high pressure ducts to the vicinity of each of the various zones of the building. The air for each zone then flows from the high pressure duct through a pressure-reduction box or pressure regulator to a low pressure duct from which the air is discharged through variable volume outlets which are thermostatically controlled so that they supply reduced quantities of air at reduced loads. The pressure regulator controls the flow



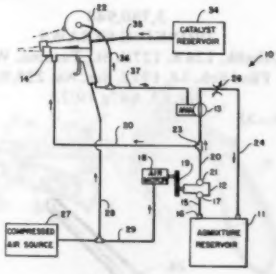
of air from the high pressure duct system to each low pressure duct so as to regulate the air pressure in the low pressure duct. The pressure regulator is controlled by the air temperature in the zone of its low pressure duct so that under low load conditions the air pressure in the low pressure duct is reduced below the pressure in that duct under high load conditions.

3,780,942

METHOD OF DISPENSING A MIXTURE OF RESIN AND EXPANDED THERMOPLASTIC SPHERES

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

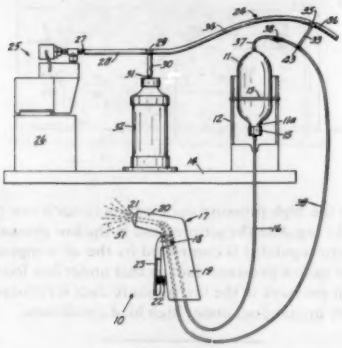
Division of Ser. No. 88,579, Nov. 12, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 293,809
Int. Cl. B05b *17/04*
U.S. Cl. 239—1 **3 Claims**



A system for and a method of dispensing an admixture including a thermosetting or thermoplastic resin and expanded thermoplastic spheres. The system includes a reservoir for the admixture. A pump, which as a rotary pump, has its inlet connected to the reservoir and is adapted to withdraw the admixture from the reservoir. The length of time that the admixture is subjected to such pressure of the pump is insufficient to either cause harmful rupturing of the expanded spheres or to cause generation of heat of sufficient magnitude to cause harmful curing of the resin. A dispensing apparatus is connected to the outlet of the pump and is adapted to spray the admixture when activated. A valve may be connected between the outlet of the pump and the reservoir. The valve is adapted to terminate the flow of the admixture to the dispensing ap-

paratus upon de-activation of the dispensing apparatus and to return the admixture withdrawn from the reservoir by the pump to the reservoir. The system may include a pressure balancing device to regulate the pressure of the system so that the system experiences little, if any, pressure differences when the system is cycled.

3,780,943
SPRAY APPARATUS AND METHOD
Duane F. Lilja, 2408 Central Ave., Minneapolis, Minn.
Filed Aug. 14, 1972, Ser. No. 280,476
Int. Cl. A01g *25/02*
U.S. Cl. 239—8 **13 Claims**

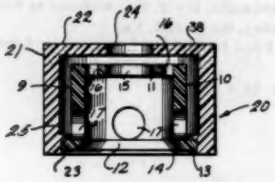


A spray apparatus and method operable to concurrently discharge a spray product and air under pressure upon a surface. The air progressively atomizes the spray product upon discharge from an applicator to convert it into a fine, particulate, uniform spray. Air supply means provides air under pressure to a spray applicator as well as a spray product reservoir. Erratic air pressure fluctuation is not present in the reservoir. The air pressure requirement for the spray apparatus is relatively small.

3,780,944
DRINKING STRAWS
Stanley G. Zubalik, 126 S. 127th St., Tacoma, Wash.
Filed Feb. 14, 1972, Ser. No. 225,951
Int. Cl. A47g *19/22*
U.S. Cl. 239—33 **9 Claims**

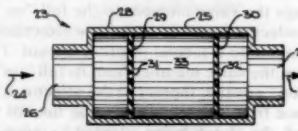
A drinking straw is compacted for storage, transport and especially for direct attachment to beverage containers designed for individual use and normally serving one person, such as those dispensed by vending machines. Also drinking straws are compacted for direct attachment in a group on other larger beverage containers such as family size, which are designed to contain multiple normal servings, thereby providing straws for more than one person. The availability of multiple straws, for example, is especially desirable when ice cream floats are served to a group.

3,780,945
FLUID IONIZATION
Nathaniel Hughes, Corona Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation-in-part of Ser. Nos. 827,451, April 23, 1969, Pat. No. 3,554,443, and Ser. No. 85,911, Nov. 2, 1970 abandoned.
This application Feb. 18, 1972, Ser. No. 227,589
Int. Cl. B05b *3/14*
U.S. Cl. 239—102 **6 Claims**



Pressure waves and ionization are produced by an energizing cell that is preferably made from a dielectric material such as Teflon. The cells are disclosed in several different configurations that serve to increase the level of ionization. A mixture is highly ionized by energizing one or more of its components prior to the formation of the mixture. If all the components are not separately energized, the mixture as a whole is energized after its formation. Important applications of the invention are in a paint sprayer and in an internal combustion engine, where engine emissions are reduced and engine performance is improved.

3,780,946
SELF-CLEANING EMITTER
Allan L. Smith, 4728 Bellue St., Carmichael, Calif., and James G. Bowen, 8875 N. Winding Way, Fair Oaks, Calif.
Filed May 30, 1972, Ser. No. 257,780
Int. Cl. B05b *15/02*
U.S. Cl. 239—107 **10 Claims**



Formed within an emitter body is an elongated channel extending between a fluid inlet port and a fluid discharge port. The cross-sectional area of the channel is small in order to limit the fluid flow to a low level. To obviate clogging by sand particles, and the like, each channel has located transversely therein at least two spaced-apart resilient diaphragms each provided with a central orifice capable of enlarging as a particle lodges in the orifice and causes a pressure differential between the two opposite surfaces of the diaphragm. As the orifice expands, the particle is impelled through the orifice, thereby unclogging the orifice. This process is repeated as the particle proceeds through the emitter, the particle finally emerging from the emitter's discharge port onto the adjacent ground surface.

3,780,947

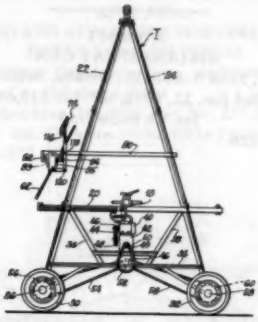
MOBILE IRRIGATION APPARATUS AND ALIGNMENT CONTROL

Max H. Ririe, Gering; Murray C. Roland, and Rich Olson, both of Scottsbluff, all of Nebr., assignors to Lockwood Corporation, Gering, Nebr.

Continuation-in-part of Ser. No. 129,793, March 31, 1971, Pat. No. 3,712,544. This application Mar. 24, 1972, Ser. No. 237,692

Int. Cl. B05b 3/00

U.S. Cl. 239—177 8 Claims



A mobile irrigation system which makes use of an elongate water distributor pipe mounted upon support towers for movement over terrain in which switch actuating means in each of the control towers is stabilized to minimize inadvertent movements and adjusted to compensate for wind effect with the result that better alignment is achieved between towers.

3,780,948

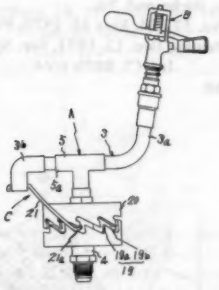
APPARATUS FOR AUTOMATICALLY SPRINKLING LIQUIDS

Hiromu Kumaoka, 214, Tokuda, Kibi-cho, Areta-gun, Wakayama-ken, Japan

Filed Apr. 17, 1972, Ser. No. 244,666

Int. Cl. B05b 3/08

U.S. Cl. 239—236 3 Claims



An apparatus for automatically sprinkling a liquid comprising a liquid supply vertical tube connected at its lower end to a liquid supply source, a swivel tube connected to the upper end of the vertical tube and adapted to be swivelled about the axis of the vertical tube while guiding the liquid from the vertical tube toward a horizontal or obliquely upward direction, a sprinkler having a jet nozzle and mounted on the distal end of the swivel tube and automatically rotatable by the jet energy of the liquid, the sprinkler being so positioned that the axis thereof intersects the axis of the vertical tube at an angle greater than 0° but smaller than 90°, and swivel control means mounted on the connection of the vertical tube and the swivel tube for swivelling the swivel tube while intermittently and angularly displacing the same in a definite direction by utilizing the reaction force of the liquid jet delivered from the sprinkler.

3,780,949

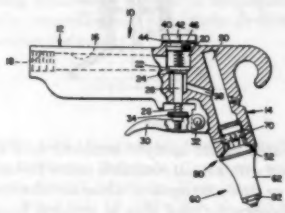
PRESSURE REDUCING AIR GUN

Thomas M. Gavin, 35 Roseland Ter., Longmeadow, Mass.

Filed Nov. 24, 1972, Ser. No. 309,065

Int. Cl. B05b 1/28

U.S. Cl. 239—291 3 Claims



An air gun designed to offer extra protection in the forms of an air screen barrier developed around a main discharged air stream to reduce the danger of chip fly back and air overload pressure relief means for reducing static nozzle pressure to a value less than any value as established by any regulatory agency for safety purposes.

3,780,950

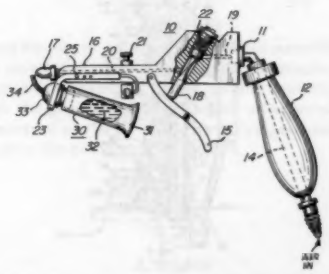
PAINT ACCOMODATING MODULES ADAPTED FOR USE WITH SPRAY GUNS

William B. Brennan, 26 Nottingham Rd., Edison, N.J.

Filed Feb. 7, 1972, Ser. No. 223,978

Int. Cl. B05b 7/08, 7/24

U.S. Cl. 239—306 7 Claims



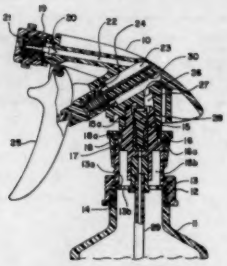
A paint containing module comprises a reservoir portion for containing a liquid such as paint. The reservoir portion is fabricated from a flexible transparent material and this portion communicates via an aperture with a liquid discharge portion having an arcuate arm with a liquid passageway, the passageway communicates with the reservoir portion at one end of the arm and with a tip portion at the other end of the arm. When the tip is held in close proximity to the nozzle of a spray gun the liquid is drawn via the passageway and discharged.

3,780,951

LEAKPROOF HEAD FOR HAND SPRAYER

Richard T. Powers, Cincinnati, Ohio, assignor to The AFA Corporation of Florida, Miami Lakes, Fla.

Filed Jan. 30, 1973, Ser. No. 327,968
Int. Cl. B65d *83/14*
U.S. Cl. 239—333 **8 Claims**



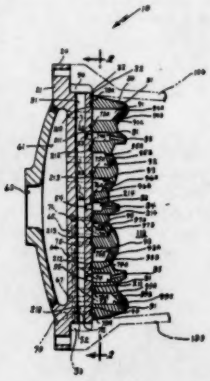
A hand-operated liquid sprayer attached to a liquid container is provided with a hand rotatable screw collar which can be screwed up or down to open or close an atmospheric vent passage to the container and thus to prevent liquid leakage from the container through the vent when the vent passage is closed regardless of the attitude of the container, and, to allow atmospheric venting of the container's interior when the vent passage is open.

3,780,952

TENSION BRAZED FACE INJECTOR

David H. Huang, Woodland Hills, Calif., assignor to The United States of America as represented by the Secretary of the United States Air Force, Washington, D.C.

Filed May 17, 1972, Ser. No. 254,140
Int. Cl. F02m *55/00*
U.S. Cl. 239—424.5 **3 Claims**



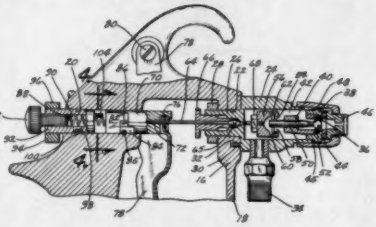
An injector for a liquid propellant rocket engine and a method of manufacturing the injector. The injector comprises a body structure portion of high strength, lightweight alloy to which is tension brazed a faceplate portion of nickel at each of the joints formed at the body structure-faceplate interface. Each brazed joint is divided by a purge groove. The interface as a whole, and the plurality of brazed joints, may be considered to be basically a flat-face brazed joint with its principal workload in tension. As a result of the segmented construction of the injector, and because of the purge grooves therein, the structural soundness of each brazed joint can be statically tested and definitely ascertained, prior to actual use of the injector, by pressurizing the purge grooves, and noting if there is any drop in the pressure. Additionally, premature contact by the liquid propellant constituents (e.g., fuel and oxidizer), because of leakage between propellant manifolds in the injector while the injector is in use, in flight or otherwse, is prevented by introducing an inert (i.e., non-reactive) gas pressurant, such as nitrogen, into the purge grooves at a pressure which is higher than the propellant constituents. Further, the method of manufacture permits the simple, reliable, low cost, and relatively rapid fabrication of the injector.

3,780,953

AIRLESS SPRAY GUN

Jerry P. Malec, 5108 N. 85th St., Omaha, Nebr.

Filed Jan. 21, 1972, Ser. No. 219,699
Int. Cl. B05b *1/30*
U.S. Cl. 239—526 **6 Claims**



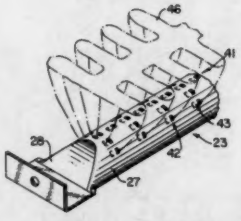
An airless spray gun is disclosed herein which has a substantially reduced number of component parts. The gun includes a trigger locking assembly for preventing the actuation of the spray gun as desired. The airless spray gun also includes a novel valve rod and means for detachably mounting the same in the gun which permits rapid assembly and disassembly of the gun. An improved valve seat is also disclosed which substantially reduces the cost of manufacturing the same.

3,780,954

BURNER CONSTRUCTION

Francis S. Genbauffs, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 37,654, May 15, 1970, Pat. No. 3,647,146.
This application Dec. 13, 1971, Ser. No. 207,675
Int. Cl. B05b *1/14*
U.S. Cl. 239—560 **5 Claims**



A burner construction having wall means defining a chamber for receiving fuel from a source thereof, the wall means having a plurality of port means passing therethrough

and interconnecting the exterior of the wall means with the chamber whereby fuel will issue from the chamber out through the port means. The port means are arranged in a pattern through the wall means to define a first row of aligned spaced port means and a plurality of second rows of aligned spaced port means transverse and adjacent to the first row in spaced parallel relation to each other with the spacing between adjacent second rows being greater than the spacing between adjacent port means in the first row so that secondary air will be provided in a sufficient amount for all of the port means of the burner construction for proper fuel combustion.

3,780,955

METHOD AND APPARATUS FOR SPREADING A FERTILIZING MATERIAL

Harold S. Palmer, Oskaloosa, Iowa, assignor to Productive Acres Mfg., Co., Oskaloosa, Iowa

Filed Mar. 22, 1972, Ser. No. 237,162
Int. Cl. A01c *19/00*; E01c *19/20*
U.S. Cl. 239—672 **4 Claims**

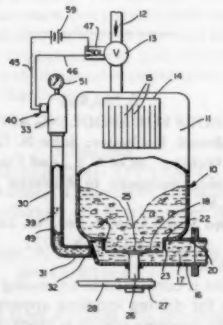
The method and apparatus provides for material from the discharge outlet of a vehicle body being divided into a predetermined number of equal but separate streams of material. A spreader belt projected transversely from one side of the vehicle body is divided transversely into sections corresponding in number to one half of the material streams. Each of the material streams is channeled to a corresponding transverse section on a spreader belt, after which the material is levelled to a uniform depth over the complete width of a spreader belt. The material is then progressively discharged to the ground at a constant rate in one direction transversely of a spreader belt and over the longitudinal length of such belt.

3,780,956

LIQUID LEVEL CONTROL FOR PULPING APPARATUS

Blaine Monroe Miller, Jr., Malvern; Wayne T. Buckman, Pipersville, and Ellis R. Warner, Jr., West Chester, all of Pa., assignors to The Hobart Manufacturing Company, Troy, Ohio

Filed Sept. 28, 1971, Ser. No. 184,460
Int. Cl. B02c *13/14*
U.S. Cl. 241—34 **9 Claims**



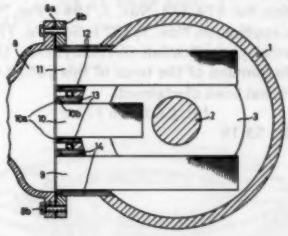
A liquid level control is provided for a pulping apparatus, wherein the pulping apparatus is of the type that is adapted to receive waste and other debris, along with water, for abrading or otherwise comminuting the waste in a water medium within the pulper, and then for discharging a slurry formed thereby, wherein the liquid level within the pulper must continuously or periodically be replaced. A closed-ended vertically disposed line is tapped into the lower end of the pulper, and adapted to receive liquid therein, with air being trapped at the upper end of the vertically disposed member. The trapped air is adapted for actuating a switch, which in turn actuates a valve or other suitable means for controlling the amount of water or other liquid to be supplied to the pulper. A pressure gauge may also be provided at the upper end of the closed-ended tubular member, in order to give a visual indication of the pressure of the trapped air. Also, a restricter may be provided between the lower end of the vertically disposed tubular member and the trapped air at the upper end that actuates the switch, for the purpose of retarding fluctuations, or providing a dampening effect with respect to fluctuations attendant to substantially instantaneous reductions in water level and/or pressure within the pulper.

3,780,957

SCREEN ARRANGEMENT FOR STIRRING MILLS

Karl-Heinz Wilhelm, Bobstadt, Germany, assignor to Firma Draiswerke GmbH, Manheim, Germany

Filed July 19, 1971, Ser. No. 163,672
Claims priority, application Germany, July 28, 1970, P 20 37 258.1
Int. Cl. B02c *13/284*, *17/16*
U.S. Cl. 241—172 **10 Claims**



A closed stirring mill for processing solid materials in liquids having a stirrer and a plurality of spherical grinding elements and a screen arrangement at the ground material outlet to hold back the grinding elements wherein the screen arrangement consists of one or more screen cartridges attached to the jacket wall or the cover plate of the mill.

3,780,958

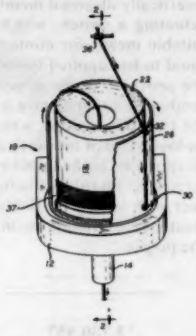
YARN FEEDING AND STORAGE DEVICE FOR TEXTILE PRODUCING MACHINE

Jose Castillo Deniega, Elmhurst, and Edward M. Tellerman, Woodmere, both of N.Y., assignors to Wesco Industries Corporation, Plainview, N.Y.

Filed Sept. 28, 1971, Ser. No. 184,527
Int. Cl. B65h *51/20*
U.S. Cl. 242—47.12 **3 Claims**

There is disclosed a device for feeding a filament from a supply thereof to a machine wherein said filament may be used for knitting, weaving or spooling. A storage drum is fixedly mounted at one end thereof to a frame member. The filament is guided in a first direction, from a supply thereof to a

position adjacent said one end of the drum, where it is wound about the drum to form a plurality of windings which advance in a second direction, opposite to said first direction, toward the other end of the drum. The filament is drawn off the drum



in said second direction to the other end of the drum, where it reverses direction and travels through an internal passage in the drum, in said first direction, and through an aperture in the frame member, toward the machine requiring said filament.

3,780,959

SUPPLY AND TAKE-UP SYSTEM FOR FILM AND THE LIKE

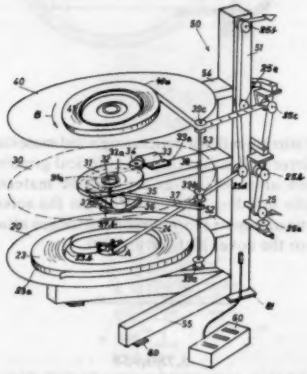
Willi Burth, Marienplatz 4, Ravensburg, Germany

Division of Ser. No. 874,334, Nov. 5, 1969, Pat. No. 3,661,337. This application Nov. 3, 1971, Ser. No. 195,228

Claims priority, application Germany, Oct. 18, 1964, P 19 52 592.9. The portion of the term of this patent subsequent to May 9, 1989, has been disclaimed.

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.18 **12 Claims**



A pair of coaxial horizontal disks, driven by respective motors, respectively support a supply coil and a take-up coil of a film strip passing through a projector on its way from the first to the second disk. A central cutout in the first disk accommodates the pivot of a lever whose free end has a bifurcation engaging a portion of the unwinding film strip formed into a loop by a pair of rollers disposed in the cutout downstream of that bifurcation. If the loop tightens or expands because of insufficient or excessive relative unreeling speed, the lever is deflected in one direction or the other to actuate one of two sensitive switches in a manner modifying the speed ratio of the two motors to restore the normal shape of the loop whereby the lever returns to a centered position.

3,780,960

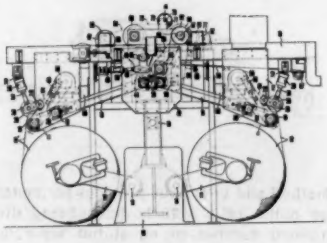
WEB SPLICING APPARATUS

Masateru Tokuno, Nishinomiya, and Tetsuya Sawada, Kyoto, both of Japan, assignors to Rengo Kabushiki Kaisha (Rengo Co., Ltd.), Osaka, Japan

Filed Oct. 6, 1971, Ser. No. 187,107

Int. Cl. B65h *19/18*

U.S. Cl. 242—58.1 **3 Claims**



A web splicing apparatus has a pair of bilaterally disposed suction boxes with a plurality of conveyor belts passing over the suction bozes and conveying liner paper toward the opposite terminal sections of the boxes while the liner paper is being sucked by the action of said suction boxes. Outlet rolls and press rolls disposed above the opposite terminal sections of the suction boxes guide the liner paper which has been transported by the conveyor belts over the suction boxes upwardly by holding the paper therebetween. Guide plates guide the liner paper transported by said rolls to a next apparatus for treating the paper. Means is provided for controlling the press rolls so that they separate from the outlet rolls or move into pressure contact with the outlet rolls during paper feeding for splicing the tip of a liner paper transported by one of the conveyor belts with another liner paper. A cutter is also provided for severing the butt of the liner paper after splicing, and a pair of holder means for holding webs is also provided.

3,780,961

CONTROLS FOR SPOOLING APPARATUS

Ghassan N. Kahwati, Rochester; John N. Gade, Rush; James D. MacKay, Webster, all of N.Y., and Conrad J. Druzynski, Loveland, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

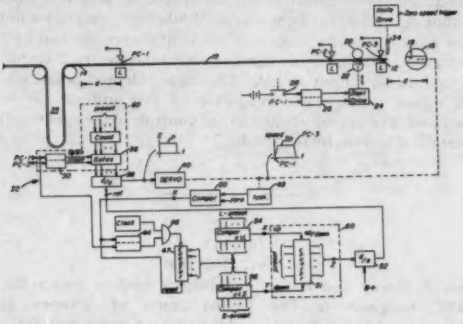
Filed May 13, 1971, Ser. No. 143,059

Int. Cl. B65h *25/22*

U.S. Cl. 242—67.3 R **9 Claims**

A digital count is converted to an analog signal for application to a servo for driving spooling apparatus. The duration during which the spooling occurs is clocked. In the event the clocked duration gets to be too long, or short, the reference for the digital-to-analog converter is adjusted, respectively to increase or decrease the input to the servo. At one point dur-

ing spooling, the count is gradually reduced (down-counting) to a certain level corresponding to a low spooling speed. The



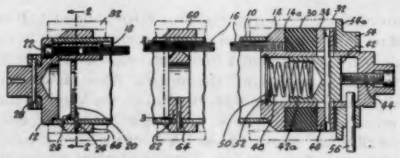
duration for low speed spooling is also clocked, and the time for starting down-counting is regulated to keep constant the duration for low speed spooling.

3,780,962

LIGHT RIGID MANDREL ABLE TO ENGAGE PAPER OR FIBRE TUBES

Josef Sykora, Drummondville, Quebec, Canada, assignor to Celanese Canada Limited, Montreal, Quebec, Canada

Filed June 1, 1972, Ser. No. 258,647
Int. Cl. B65h 75/24
U.S. Cl. 242—72 **6 Claims**



A light rigid mandrel able to engage paper or fibre tubes so as to overcome the deflection of the tubes and prevent bunching of fabric as well as greatly reduce the damage generally caused by gripping. The mandrel comprises a tubular high strength aluminum body rigidly held under compression . The tubular aluminum body is provided with a deformable material able to engage an inner part of the paper or fibre tubes, so that light and inexpensive paper tubes could be used successfully for the first time.

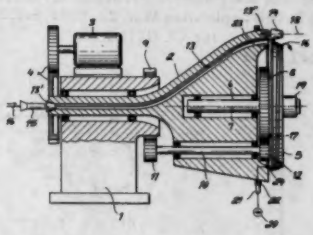
3,780,963

WIRE-LOOPING APPARATUS

Horst-Dieter Hirschfelder, Langenfeld, Germany, assignor to Fried Krupp Gesellschaft mit Beschrankter Haftung, Altendorfer, Germany

Filed Nov. 9, 1971, Ser. No. 196,962
Int. Cl. B21c 47/14
U.S. Cl. 242—82 **7 Claims**

Wire coming hot from a rolling mill traverses an eccentric duct in a rotating body and emerges therefrom at the periphery of a frustoconical disk which is centered on the axis of rotation and is held stationary by a planetary-gear system. A tapering guide roller, journaled on the body adjacent the outlet of the duct, helps wind the emerging wire about the disk periphery from which the wire loops slide off axially, the roller



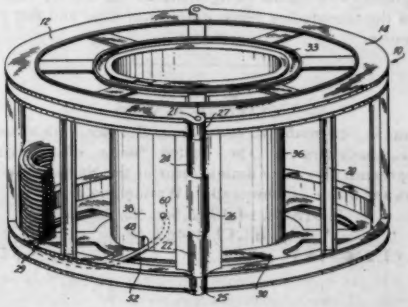
axis being oriented skew to the axis of rotation to impart an axial component to the motion of the wire exiting from the rotating body.

3,780,964

DISPENSER HOUSING FOR WIRE AND THE LIKE

Jose Angel Fernandez-Colmeiro Gonzalez, Vigo, Spain, assignor to Fernandez-Colmeiro S.A., Vigo Pontevedra, Spain

Filed Feb. 9, 1972, Ser. No. 224,685
Claims priority, application Spain, Feb. 13, 1971, 388231
Int. Cl. B65h 49/00
U.S. Cl. 242—129 **10 Claims**



A spool for a coil of wire or other product includes a core about which a coil is wound and a housing disposed about the coil. The housing includes a pair of spaced disks to which the core is secured and a cylindrical section disposed between the outer peripheries of the spaced disks. The core consists of a tube and a connector which secures the tube to the disks, whereby the core is removable from the housing while leaving the coil intact within the housing. The two ends of the coil may be led to the center of the coil in such a manner that it is possible to carry out a continuous operation whereby the ends of one spool may be joined to the end of another spool, and this may be repeated as many times as necessary to join any number of spools as one continuous line so that as one coil is unwound, the next one automatically begins to unwind and so on down the linc.

3,780,965

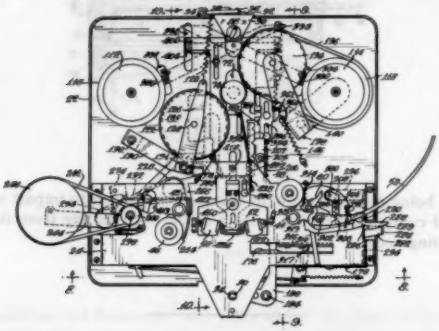
TAPE RECORDER

Norman L. Williams, Villa Park, and Allen L. Ryan, Chicago, both of Ill., assignors to Warwick Electronics Inc., Chicago, Ill.

Division of Ser. No. 666,739, Sept. 11, 1967, Pat. No. 3,606,202. This application Mar. 22, 1971, Ser. No. 126,914

Int. Cl. G11b *15/22*

U.S. Cl. 242—204 5 Claims



A two directional tape recorder apparatus having means for automatically threading tape from a supply reel to a take-up reel; means for effecting record, erase, and playback functions in either direction of movement of the tape; means for automatically reversing the direction of movement of the tape; and means for shifting transducing heads into operative association with different tracks on the tape during tape reversal. A scissors brake mechanism is provided for stopping supply and take-up turntables and to release the turntables for rotation during wind, rewind, fast wind and fast rewind operations; and a single control is provided to actuate separate slide members for selecting wind and rewind, and fast wind and fast rewind functions, with means being provided for shifting tape away from the transducing heads during fast wind and fast rewind functions.

3,780,966

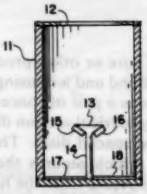
ATTITUDE SENSOR

Arthur L. Newcomb, Jr., and Aubrey G. Price, both of Seaford, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 14, 1972, Ser. No. 289,049

Int. Cl. B64g *1/10*

U.S. Cl. 244—1 SA 5 Claims



The invention consists essentially of two light sensors on a spacecraft that are mounted beneath a baffle which divides the light from a light source such as the sun or a star. The divided light reflects off of two reflective surfaces onto the two light sensors. When the spacecraft assumes its normal attitude the baffle divides the light from the light source into two equal parts cuasing the two light sensors to produce equal outputs. An electrical circuit containing the two sensors produces a zero voltage output when the outputs of the two light sensors are equal thereby indicating that the spacecraft is in its normal attitude relative to the light source. While the spacecraft is not in its normal attitude relative to the light source the two light sensors produce unequal outputs causing the electrical circuit to produce an output voltage. The amplitude and polarity of this output voltage are indicative of the attitude of the spacecraft and can be applied to the controls of the spacecraft to return it to its normal attitude.

3,780,967

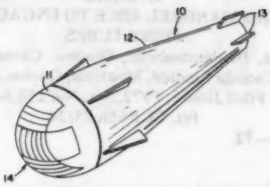
HOMING MISSILE

Ernst T. Evers, and Robert L. Morgan, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 602,453, Dec. 13, 1966 abandoned. This application July 3, 1972, Ser. No. 268,248

Int. Cl. F42b *15/16, 15/00, 15/02*

U.S. Cl. 244—3.16 2 Claims



A uniform array of quasi-optical horn shaped baffles are carried on the hemispherical nose of a missile. The horns are so made that each one has a field—of—view of a discrete portion of the space around the missile nose. Each horn is generally a hollow wedge with its point on the longitudinal axis of the missile, its open base on the nose of the missile, and with a photocell inside near its point. A discrete horn provides an output from its photocell for a particular point-source target. Each output causes a unique output from a digital—to—a nalog converter. The output of the converter is the input to a controller for the steering fins of the missile.

3,780,968

SOLID PROPELLANT ROCKET ENGINE CONTROL AND MISSILE CONFIGURATIONS

Arthur R. Parilla, P.O. Box 127, Mountain Lakes, N.J.

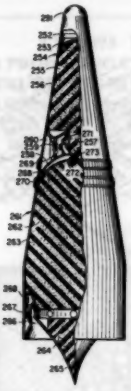
Continuation of Ser. No. 784,818, Dec. 18, 1968, which is a division of Ser. No. 607,068, Jan. 3, 1967, Pat. No. 3,489,373, which is a continuation-in-part of Ser. No. 302,222, June 14, 1963, abandoned. This application Dec. 16, 1971, Ser. No. 208,996

Int. Cl. F41g *7/00*; F42b *5/18*

U.S. Cl. 244—3.22 2 Claims

The shaping of solid propellant charges for rocket engines to provide increased acceleration at missile launch without exceeding maximum acceleration near burnout while minimizing missile size and weight. Illustrative is a long-range ballistic missile having multiple rocket engine stages arranged in tandem, in which each stage has a reaction nozzle and associated propellant charge having a shape which is coordinated with the missile flight trajectory including a substantially conical or

frusto-conical configuration providing a burning surface which decreases in area with burning time. Variable area reac-



tion nozzles can be employed in each stage in combination with the conically-shaped propellant charges to optimize engine efficiency and increase engine versatility.

3,780,969

WING CASE FOR AIR FOILS

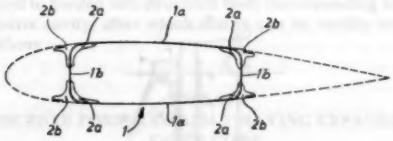
Helmut Nussbaum, Bremen, and Hilmar Schnell, Delmenhorst, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Feb. 29, 1972, Ser. No. 230,236

Claims priority, application Germany, Mar. 2, 1971, P 21 09 692.4

Int. Cl. B64c *3/20, 3/26*

U.S. Cl. 244—123 **3 Claims**



Wing case for air foils with a closed profile shell of laminated plastic reenforced preferably by boron fibers with different orientation; flanged bars as spars sandwich the shell at corners and being bonded thereto. Aluminum ribs are in the shell, the spars are preferably made of titanium, the numbers of lamina with fiber orientations in direction of wing span and ribs correspond to the differences in elastic properties of the two metals used for ribs and spars.

3,780,970

PARACHUTE APPARATUS

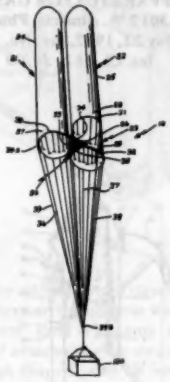
William R. Pinnell, Dayton, Ohio, assignor to The United states of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 27, 1972, Ser. No. 266,788

Int. Cl. B64d *17/34, 17/06*

U.S. Cl. 244—152 **4 Claims**

A parachute apparatus which includes a plurality of identical parachutes, each of which has a canopy, with the parachutes releasably connected together by a clustering web assembly. When the parachute apparatus is deployed with a common payload, the parachutes, with the clustering web assembly releasably connected thereto, form a cluster and carry the common payload. The web assembly holds a portion of the canopy of each of the parachutes in a reefed condition. At a preselected time, or at a preselected atmospheric pressure (or altitude), during descent of the clustered parachutes, the web assembly permits the simultaneous disreefing of all of the parachute canopies. As a result, all of the canopies simultaneously open; then they spread; and, then they inflate to the fully



open position, simultaneously. Therefore, none of the canopies need be designed to withstand the overload which normally occurs because of the frequent non-simultaneous opening, and subsequent non-simultaneous inflating, of the canopies in a cluster of parachutes during descent. Further, the current need for the use of additional (and redundant) parachutes in a cluster to assure payload recovery when one or more canopies of the parachutes, which are normally in the cluster, fail to open and/or to inflate to the fully open position during descent, is obviated. The common payload is, thereby, safely delivered.

3,780,971

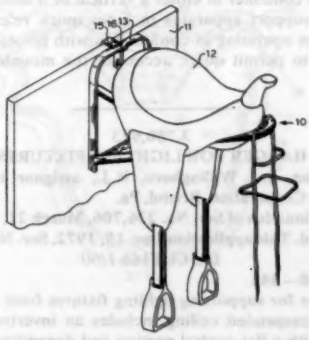
COLLAPSIBLE SADDLE RACK

Fred A. De Filipps, Maitland, Fla., assignor to The Fifth Third Bank, Cincinnati, Ohio

Filed Mar. 29, 1972, Ser. No. 239,212

Int. Cl. A47f *5/00*

U.S. Cl. 248—309 **4 Claims**



A portable and collapsible saddle rack apparatus having a frame with a member for attaching and detaching the saddle

rack to a fence board, stall door, or the like. The frame has saddle supporting member hinged thereto and a supporting brace member also hinged to the frame and shaped in a manner to engage the saddle support member for locking it in place for supporting the saddle and which may be disengaged for collapsing the saddle rack. The brace member extends through the saddle support member with a portion protruding thereabove for holding the saddle on the saddle support member and for hanging bridle.

3,780,972

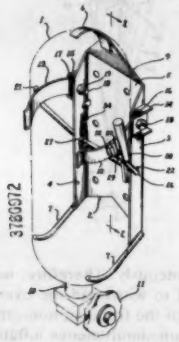
MOUNTING APPARATUS FOR GAS CONTAINERS

John C. Brodersen, 3017 W. Almeria, Phoenix, Ariz.

Filed May 22, 1972, Ser. No. 255,793

Int. Cl. A62c 39/00

U.S. Cl. 248—313 **10 Claims**



A mounting apparatus is disclosed for mounting oxygen filled gas containers used in conjunction with breathing apparatus during rescue operations. A base piece includes retaining members for positioning and retaining the gas container in the longitudinal axis. A pair of selectively actuated clamping arms extend from the base piece for positioning and retaining the gas container in the remaining two axes. A manually operated lever mechanism engages each of the clamping arms and locks the clamping arms about the gas container in a first position. In a second position, the manual lever mechanism releases the pair of clamping arms to permit the gas container to be withdrawn from the mounting apparatus. Supporting apparatus is also disclosed for supporting and storing the gas container in either a vertical or a horizontal position. The support apparatus includes quick release locking mechanisms operating in conjunction with pivotable support apparatus to permit quick access to the mounted gas containers.

3,780,973

HANGER FOR LIGHTING FIXTURES

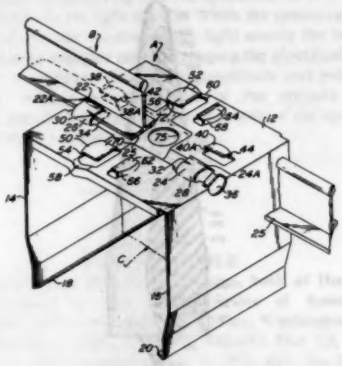
John Dalton, Jr., Willingboro, N.J., assignor to Keystone Lighting Corporation, Bristol, Pa.

Continuation of Ser. No. 236,706, March 21, 1972, abandoned. This application Dec. 15, 1972, Ser. No. 315,492

Int. Cl. F16b 1/00

U.S. Cl. 248—342 **15 Claims**

A hanger for supporting lighting fixtures from inverted T-bars of a suspended ceiling includes an inverted U-shaped member with a flat central portion and depending legs. Pairs of spaced tabs are struck from the central portion and extend in a plane thereabove facing in the same direction. Integrally struck clips face opposite the tabs and are spaced therefrom by a distance such that the width of the T-bar flange can be accommodated between the lips of the clips and the rear wall of the tabs. Arcuate depressions below the tabs and coextensive



with the dimension across the hanger allow the hanger to be pivoted about the T-bar flange and then slidably interlocked under the clips by detents.

3,780,974

DEVICE FOR THE FIXING, BEING COMBINED WITH SLOW LOWERING, OF THE SLIDING POLE OF A PORTABLE MOTION PICTURE SCREEN STAND

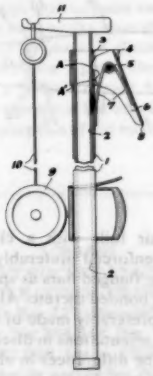
Sasuke Takahashi, 34/11, Yasunakacho-6-chome, Yao City, Prefecture of Osaka, Japan

Filed Dec. 27, 1971, Ser. No. 212,001

Claims priority, application Japan, Dec. 30, 1970, 45/128356

Int. Cl. F16b 7/10

U.S. Cl. 248—411 **3 Claims**



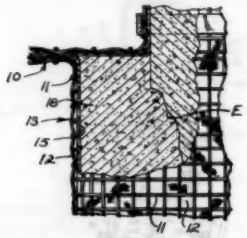
A device for the locking and slow lowering of the sliding pole of a portable motion picture screen stand, which is characterized by mounting a sliding pole into a hollow supporting pole so that the former can go up and down along the inside of the latter supporting piece is fixed to a hole which is provided at the upper part or at an appropriate part of the hollow supporting pole and a lever is hinged to said supporting piece by an axis. In addition, the lower end of said lever projects from the outside of the hollow supporting pole by the

force of a spring and the inside of the lever comes in contact with the outside of the sliding pole with the upper and lower points of contact which are provided at about even distance from the axis and which have a dent therebetween.

3,780,975
MEANS FOR PRODUCING CAST-IN-PLACE STRUCTURES IN SITU

Lee A. Turzillo, 2078 Glengary Rd., Akron, Ohio

Filed Nov. 23, 1971, Ser. No. 203,103
Int. Cl. E02d *5/60*
U.S. Cl. 249—1 **4 Claims**



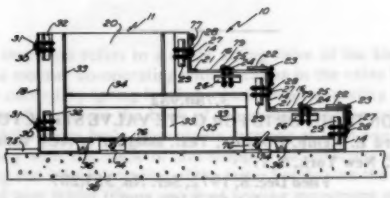
Laminated sheet material, and apparatus utilizing the same, for producing and/or repairing structural bodies of self-hardening fluid cementitious material in a sub-aqueous and/or subterranian situs. Sheet material includes wire-mesh backing, and porous fabric bonded thereto, substantially without blocking of fabric pores, and is adapted for supplying in rolls or sheets to be cut and selectively formed at the situs into matrices or molds having body-forming cavities for producing or repairing concrete structures of many shapes and sizes.

The apparatus includes such laminated sheeting formed as a substantially rigid matrix, suitably reinforced and/or anchored at the situs to have porous fabric layers presented inwardly, to define matrix cavity walls backed by the openwork material. Fluid cementitious material supplied to the matrix cavity adapted to harden into structural body corresponding to shape of matrix cavity, after which matrix can be readily removed therefrom.

3,780,976
CONCRETE FORM ASSEMBLY HAVING EXPANDABLE INNER CORE

Albert J. Messier, Mendon St., Blackstone, Mass.

Filed June 21, 1971, Ser. No. 154,919
Int. Cl. B28b *7/22*
U.S. Cl. 249—14 **8 Claims**

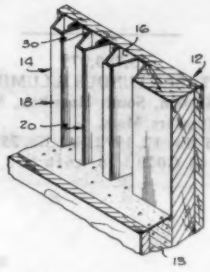


A form assembly for prefabricating a concrete structure by casting that includes an outer member and an inner member between which a cavity is defined, the inner member having expandable walls that are urged outwardly by jack elements and that are releasable to provide for removal of the inner and outer members after the structure is cast and is still curing in place.

3,780,977
CONCRETE FORM LINER

Stephan S. Dashew, Los Angeles, Calif., assignor to La Mesa Industries, Inc., Los Angeles, Calif.

Filed Dec. 10, 1971, Ser. No. 206,686
Int. Cl. E04g *11/08*; **B28b** *7/00*; **E04g** *9/08*
U.S. Cl. 249—15 **4 Claims**

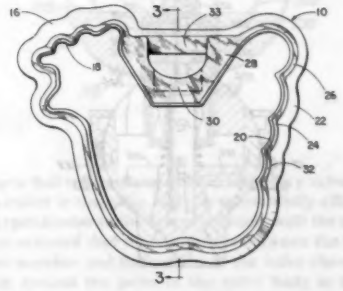


A liner assembly for attaching to a structural concrete form to provide a desired texture to concrete walls and columns, including multiple form liner elements constructed to be snapped together and attached to the structural form. Each of the elements is trough shaped, with an inner wall and pair of side walls, one of the side walls having a flange with a first hook at its end, and the other side wall having a second hook and a retainer near the second hook. The form liner elements can be snapped together, with the first hook of one element retained between the second hook and retainer of another form liner element in an overlapping, interlocking connection, and the flanges of each of the elements can be nailed or otherwise fastened to the structural form. The interlocking elements allow an architect to vary the wall texture or pattern at selected areas, such as at doorways, and facilitates reuse of the liners because they can be taken apart and reassembled to any desired wall size, the interlocking feature preventing leakage of concrete between the liner elements.

3,780,978
FOOD COOKING FORM

Donald W. Proul, 1506 Mariners Dr., Newport Beach, Calif.

Filed Mar. 27, 1972, Ser. No. 238,438
Int. Cl. B28b *7/34*, *7/38*
U.S. Cl. 249—135 **2 Claims**



The invention provides a form which is used in conjunction with a frypan or grill for cooking foods. By confining eggs or batter or other food to be cooked to the area within the form, food products can be given an interesting and appealing ap-

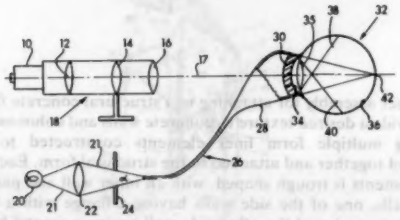
pearance. More than that, however, use of the form permits control of product thickness and provides a food product whose taste and "feel" differ from what that product would have in the absence of the form. The form is made of heat conductive metal, is plastic coated, and has mass and weight so that when used in conjunction with the hot surface of a frypan or grill, food is cooked rapidly at its outer edges and at its bottom to form a shell in which still-liquid portions of the body of foodstuff are contained when the form is lifted away to be used again.

3,780,979

ADJUSTABLE FUNDUS ILLUMINATION

Henri F. de Guillebon, South Hamilton, Mass., assignor to Clinitex, Inc., Danvers, Mass.

Filed May 12, 1972, Ser. No. 252,838
Int. Cl. G02b *5/16*; **A61b** *3/10, 3/14*
U.S. Cl. 351—16 **13 Claims**



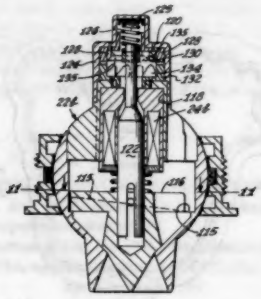
Method and apparatus are provided for wide angle illumination of the fundus of the eye. Even illumination of the fundus is obtained by adjustment of the input light to the optical fibers which controls the light beam transmitted from the fibers and the intensity and distribution thereof on the fundus.

3,780,980

REMOTELY CONTROLLED VENTILATION VALVE

Allen Kallel, Santa Ana, Calif., assignor to Wemac Company, Santa Ana, Calif.

Continuation of Ser. No. 829,672, June 29, 1969, abandoned. This application June 17, 1971, Ser. No. 154,215
Int. Cl. F16k *31/10*
U.S. Cl. 251—138 **12 Claims**



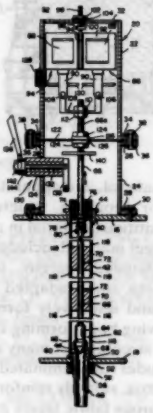
In an airplane ventilation system an overhead pressurized air outlet directs an air stream downward towards a passenger and is provided with a valve operated by a solenoid-actuated reciprocative means that cooperates with circumferential sets of teeth. The solenoid reciprocates the reciprocative means to cause the fixed teeth to rotate the reciprocative means step-by-step for operating the valve.

3,780,981

AUTOMATIC TANK PLUG VALVE

Vladimir Horak, 353 High St., Closter, N.J., and John Vretenar, 9110 Kennedy Blvd., North Bergen, N.J.

Filed Jan. 24, 1972, Ser. No. 220,231
Int. Cl. F16k *1/38, 31/10*
U.S. Cl. 251—144 **10 Claims**



An automatic plug valve is mounted within a tank containing fluid to be dispensed through an outlet opening having a valve seat. The valve includes a valve head having a conical shape which conforms to the frusto-conical shape of the valve seat. A valve stem is connected to the valve head and extends exteriorly of the tank. Automatic actuating means is provided to lift the valve stem and valve head at selected intervals, and manual adjustment means, located exteriorly of the tank, are provided for raising and lowering the valve actuating means to selectively regulate the distance through which the valve head is elevated.

3,780,982

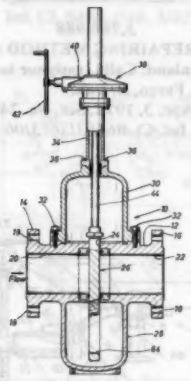
CONTROL PORTS FOR GATE VALVE STRUCTURE

Willard E. Kemp, Houston, Tex., assignor to ACF Industries, Inc., New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,287
Int. Cl. F16k *3/00*
U.S. Cl. 251—210 **9 Claims**

A gate valve structure having a slab gate with a relatively large diameter main port or bore therethrough and a plurality of relatively small diameter bores adjacent the main bore. Upstream and downstream seating assemblies are positioned on opposed sides of the slab gate. The small diameter control ports or bores have longitudinal axes inclined outwardly with respect to the upstream seating assembly with the inclination

being of a magnitude to permit the downstream ends of the small diameter bores to clear the downstream seating assembly before the upstream ends of the bores are in fluid communication with the flowline thereby to minimize the fluid pressure differential upon the initial opening of the main bore.



3,780,983

VALVES FOR CONTROLLING FLUID FLOW

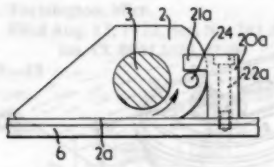
Alan Eric Topham, 19 Kingston Rd., and Cedric Henry Topham, Woodlands View, Grindale Rd., both of Boynton, Bridlington, England

Filed Dec. 6, 1971, Ser. No. 205,268

Claims priority, application Great Britain, Dec. 7, 1970, 58031/70

Int. Cl. F16k 5/14

U.S. Cl. 251—158 **3 Claims**



The invention refers to a quick acting valve of the kind in which a stopper co-operating with a seating in the valve body bore is carried by spring-loading means on an operating spindle extending across the back of the stopper and across the bore of the valve body, the spindle carrying at least one cam co-acting with the back of the stopper for effecting quick opening and closing rotation of the latter bodily with the spindle and also initial lifting and final seating movement of the stopper. The valve mechanism includes the provision of at least one stop member secured on the back of the stopper and arranged to be contacted by the cam or a projection from the latter during initial rotation of the cam for effecting, positive lifting of the stopper from its seating in the valve body bore for rotation with the cam, i.e., in the event of high fluid pressure acting on the back of the stopper and overcoming the normal lifting action of the spring loading means.

3,780,984

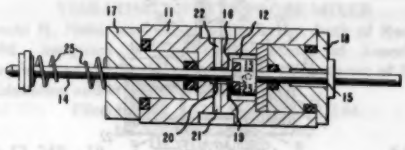
APPARATUS AND METHOD FOR FLUID HANDLING AND SAMPLING

William J. Ambrose, Springfield, Pa., and James E. McErlane, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 753,199, Aug. 16, 1968. This application Mar. 4, 1971, Ser. No. 121,147

Int. Cl. F16k 1/32

U.S. Cl. 251—282 **3 Claims**



An apparatus and a method for handling and sampling fluids which comprises principally a nonpumping valve designed so that in operation it moves less than a microliter of fluid, and a pumping valve designed to aspirate a precisely determined amount of fluid into the body of the valve with no more motion than is inherent in the operation of the valve itself and with no change in the physical dimensions of the valve. These valves, when used in combination with a transfer probe and a pump designed to handle minute quantities of fluid, form a precision fluid handling and sampling system which will not contaminate or dilute the fluid to be sampled.

3,780,985

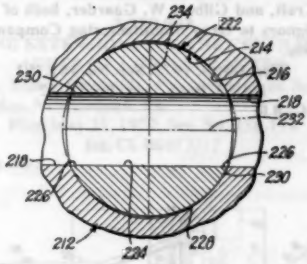
VALVE WITH ELLIPTICAL SEALING

Dean A. Perry, 2235 W. 229th Pl., Torrance, Calif.

Filed Apr. 24, 1972, Ser. No. 246,765

Int. Cl. F16k 5/02, 5/06

U.S. Cl. 251—309 **5 Claims**



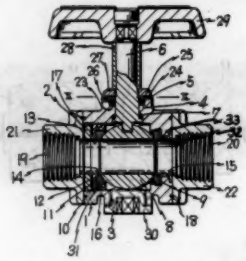
A plug or ball valve wherein either the rotary valve member, or its chamber in the valve body, is substantially elliptical in a plane perpendicular to the axis of rotation, with the axes of the ellipse so oriented that the clearances between the surface of the valve member and the surface of the valve chamber are a minimum around the ports in the valve body in the closed position of the valve member, and are a maximum intermediate the ports in the valve body in the closed position of the valve member. With this construction, maximum sealing effectiveness in the closed position of the valve member is achieved, along with other advantages, such as reducing the torque required to rotate the valve member.

3,780,986

BALL VALVE

Katsuji Fujiwara, 191, Nishitani, Hiraaka-cho, Kakogawa-shi, Hyogo-ken, Japan

Filed Apr. 12, 1972, Ser. No. 243,354
Claims priority, application Japan, Apr. 28, 1971, 46/34234
Int. Cl. F16k 5/06
U.S. Cl. 251—315 6 Claims



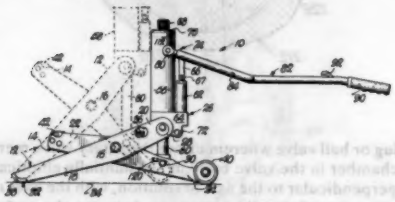
A ball valve includes a main body having an axially extending passageway within which a valve body is positioned. Within the passageway, the opposite sides of the valve body are fitted against valve seat members. One valve seat member is secured by a valve seat retainer which is adjustably secured within the passageway by a corrugated washer and an adjusting member in threaded engagement with the main body, the other valve seat is held by a projection on the main body which extends radially inwardly into the passageway. Extending annularly about the radially outer surfaces of each valve seat member is an annular groove which accommodates any heat expansion of the valve seat members. At each end of the passageway, an end member is clamped to the main body, one end member forms an inlet port and the other forms an outlet port. The ball valve can be easily disassembled for inspection purposes and its simple arrangement makes it easy to manipulate and maintain.

3,780,987

LOW PROFILE JACK FOR FORK LIFT TRUCKS

Roger L. Craft, and Gilbert W. Gaarder, both of St. Joseph, Mo., assignors to Gray Manufacturing Company, Inc., St. Joseph, Mo.

Filed July 9, 1971, Ser. No. 161,191
Int. Cl. B60p 1/48; B66f 3/22
U.S. Cl. 254—8 R 34 Claims



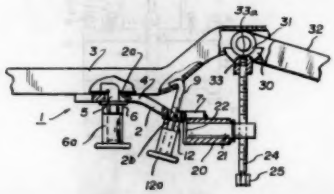
A low profile lifting jack having a walking beam frame with an object-engaging lifting member that travels in an arcuate path upwardly and forwardly toward the vehicle being lifted during the power stroke of the jack. A lift pad carried on the lifting member is movable between two positions presenting concavo-convex surfaces respectively for engagement with the vehicle being lifted. A permanently attached manual handle operates a fluid actuator integrally carried on the jack and is pivotal between a position facilitating transporting the jack, and another horizontal position for storage. The fluid actuator folds from a vertical operating position to a low, generally horizontal storing and carrying position.

3,780,988

BUSHING REPAIRING METHOD AND TOOL

John H. Castoe, Sunland, Calif., assignor to Branick Manufacturing Company, Fargo, N. Dak.

Filed Apr. 3, 1972, Ser. No. 240,352
Int. Cl. B66f 3/36, 3/00
U.S. Cl. 254—100 6 Claims



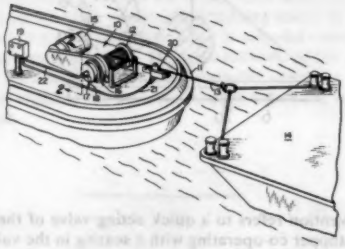
A bushing replacement tool including a saddle member to embrace and permit lowering of an end of the control arm of a front wheel assembly of a vehicle for servicing or removal of a bushing thereof. The saddle member is attached to a threaded shaft which imparts upward and downward movement of the saddle member as desired. The shaft is supported in a support bracket of the support member which is adapted to be attached to the underside of the vehicle.

3,780,989

TOWING WINCH

Earl A. Peterson, 4111 Chestnut Ave., Long Beach, Calif.

Filed Aug. 12, 1971, Ser. No. 171,278
Int. Cl. B66d 1/48
U.S. Cl. 254—173 R 11 Claims



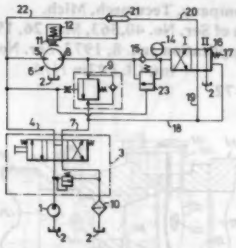
A towing winch incorporating apparatus for maintaining controlled tension in a towing cable and relative distance between the towing and towed object. A towing vessel is supplied with a winch incorporating a clutch capable of maintaining controlled tension in a towing cable. The clutch is controlled by a regulator system which is responsive to changes in the tension in the towing cable altering the output torque of the clutch to maintain a predetermined level of tension in the towing cable. Apparatus responsive to the linear displacement of the towing cable maintains a predetermined linear distance between the towing vessel and towed object.

3,780,990

BRAKE CONTROLLING DEVICE

Sven Bertil Gosta Edlund, and Bo Frans Ake Sodersten, both of Gullanget, Sweden, assignors to AB Hagglund & Soner, Ornskoldsvik, Sweden

Filed Jan. 24, 1972, Ser. No. 220,133
Claims priority, application Sweden, Jan. 28, 1971, 1029/71
Int. Cl. B66d 1/48, 5/02
U.S. Cl. 254—173 2 Claims



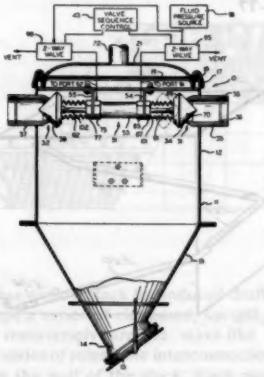
The present invention relates to a device for controlling the brake in winches which are driven by a hydraulic motor and have a brake which is engaged when not actuated and arranged to disengage when a pressure medium is delivered to a hydraulic cylinder connected to the brake. The invention is chiefly characterized by a brake controlling unit which is connected to the high pressure side of the motor and is arranged to regulate the supply of pressure medium to the brake's hydraulic cylinder, depending on the size of the motor load, so that during a lifting operation, the brake releases only after the pressure on the motor's high pressure side substantially corresponds to the pressure required to balance the load. In addition, means are provided to release the brake at a pressure during lowering of the load, independent of the size of the load.

3,780,991

PROPORTIONING HOPPER FOR GRANULAR MATERIALS

Arthur J. Evans, Northville, Mich., and Joseph C. Morin, New Westminister, British Columbia, Canada, assignors to Whitlock, Inc., Farmington, Mich.

Filed Aug. 17, 1972, Ser. No. 281,530
Int. Cl. B01f 5/00, 15/04
U.S. Cl. 259—18 7 Claims



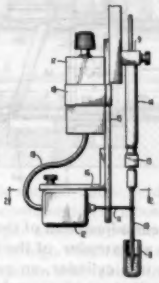
A proportioning hopper for granular plastics and like materials, having two aligned inlet ports on opposite sides of the hopper, with two conical closure members of moderately soft elastomer material each engaging one port in a line contact seal to close the port. A double-acting pneumatic or hydraulic cylinder retracts the closure members to admit material to the hopper; a biasing spring in the cylinder normally maintains both ports closed. The two closure members cannot be held open simultaneously. A timing and sequence control actuates the cylinder to open the ports alternately in timed sequence to mix two different materials in the hopper in predetermined proportions.

3,780,992

VIBRATING PIPETTE PROBE MIXER

Hiroshi H. Nishi, and Charles McCarthy, both of Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed July 17, 1972, Ser. No. 272,144
Int. Cl. B01f 11/00, 15/02
U.S. Cl. 259—19 6 Claims



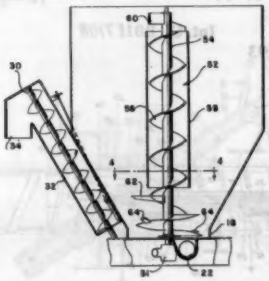
A vibrating pipette probe mixer is disclosed having means to vibrate the pipette so that when delivering extremely small quantities of liquid, accurate mixing and dispensing is achieved. The vibrating means may be either a mechanical vibrator attached to the pipette by a stiff wire or a fluidic oscillator attached to the pipette by opposing disc shaped diaphragms.

3,780,993

AGITATING EXTENSIONS FOR THE CENTRAL MIXING AUGER OF A GRINDER-MIXER

Charles M. Kline, Reinholds, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed May 31, 1972, Ser. No. 258,174
Int. Cl. B01f 5/12
U.S. Cl. 259—97 6 Claims



The present invention relates to the provision of a plurality of agitating extensions to the lower auger flighting of the cen-

tral mixing auger of a grinder-mixer of the type having a tank supported on a mobile frame. The agitating extensions are fixed directly to the lower flighting and project outwardly therefrom with the outer ends thereof terminate in close proximity to the side walls of the tank, thereby tending to engage and agitate material being contained within the lower portion of the mixing tank.

3,780,994

METHOD OF AND MEANS FOR ADJUSTING THE FLOW OF PLASTIC MATERIAL IN AN EXTRUDER CYLINDER

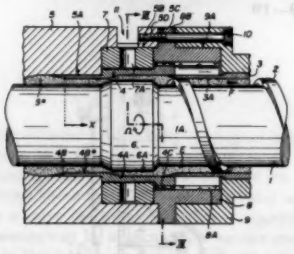
Klaus Kneller, Nurensdorf, Switzerland, and Gerard Schaeffer, Ambilly, France, assignors to Schweizerische Industrie-Gelellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 3, 1971, Ser. No. 204,488

Claims priority, application Switzerland, Dec. 22, 1970, 19028/70

Int. Cl. B29b *1/10*; B30b *15/00*

U.S. Cl. 259—191 **10 Claims**



To facilitate the linear adjustment of the flow rate of plastic material delivered by an extruder, of the type wherein a feed screw coaxially turns in a cylinder, an annular flow space is formed between the cylinder and an unthreaded downstream extension of the feed screw, this flow space including a constricted annular passage of variable length defined between two relatively axially shiftable collars on the cylinder and on the screw extension. In a specific embodiment, the cylinder is divided into an upstream section, a downstream section and an axially shiftable middle section, the latter carrying the outer one of the two collars and being held against rotation while a nut threadedly engaging that middle section is manually rotatable to displace it between a position of mutual alignment and a position of complete relative offset of these collars.

3,780,995

FEEDING ATTACHMENT FOR MACHINE PROCESSING FOAMABLE PLASTIC MATERIALS

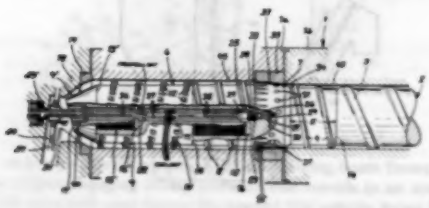
Erwin Burkle, Benediktbeuren, and Felix Loebe, Munich, both of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Nov. 1, 1971, Ser. No. 194,656

Claims priority, application Germany, Oct. 31, 1970, P 20 53 646.3

Int. Cl. B01f *7/08*

U.S. Cl. 259—193 **27 Claims**



An attachment for a molding machine, serving to prepare an injectable mass including a propellant, has a plasticizing screw which feeds a mass of liquefied plastic material to a narrow peripheral gap between a rotating mixing head and a housing. One or more passages, connected to a source or propellant, open generally radially into this gap to admix the propellant with the plastic mass in a region in which this mass forms a thin layer moving perpendicularly to these passages.

3,780,996

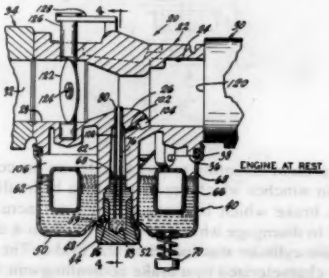
SELF-PRIMING CARBURETOR

Warren D. Nutten, Grafton, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 40,563, May 26, 1970, abandoned. This application Jan. 8, 1973, Ser. No. 322,029

Int. Cl. F02m *1/16*

U.S. Cl. 261—72 **17 Claims**



A self-priming chokeless carburetor having only a throttle valve in the air-fuel mixture conduit supplemented by a relatively large priming well disposed serially between a fixed metering orifice communicating with the float bowl reservoir and the inlet to the main nozzle tube of the carburetor. When the engine is not running, the priming well fills with fuel to the level of the fuel in the float bowl. When the engine is cranked for starting, the supply of fuel in the well is drawn up the main nozzle to supply a rich mixture for starting. When the engine is running, the well cannot refill because fuel is aspirated from the well as fast as it is supplied thereto by the metering orifice.

3,780,997

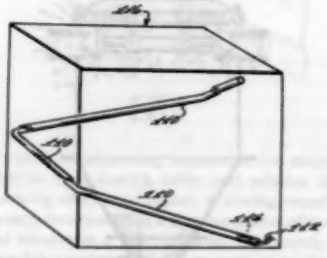
AEROBIC SEWAGE TREATMENT

William J. Hargraves, Dunedin, Fla., assignor to Bertran & Hargraves, Inc., Tampa, Fla.

Division of Ser. No. 813,242, April 3, 1969, abandoned. This application Apr. 19, 1971, Ser. No. 134,968

Int. Cl. B01f *3/04*

U.S. Cl. 261—77 **4 Claims**



Diffuser means for effecting contact between gas and a mass of liquid sewage comprising a plurality of open ended, inclined air lift pipes immersed one above another in said sewage.

3,780,998

AERATING AND AGITATING DEVICE

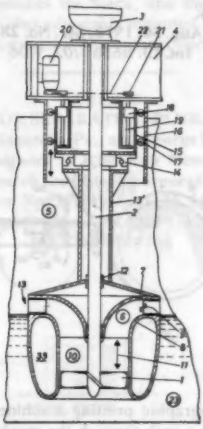
Bertram Botsch, Karlsruhe, Germany, assignor to Maschinenfabrik H. Geiger, Karlsruhe, Germany

Filed Dec. 21, 1970, Ser. No. 100,304

Claims priority, application Germany, Dec. 20, 1969, P 19 64 308.4

Int. Cl. B01f 7/16

U.S. Cl. 261—91 17 Claims



An apparatus for the aeration and agitation of fluids including a vertically suspended pumping wheel submerged in the fluid and a turbine wheel having outlet openings above the fluid surface, the pumping wheel creating a flow directed to the turbine wheel.

3,780,999

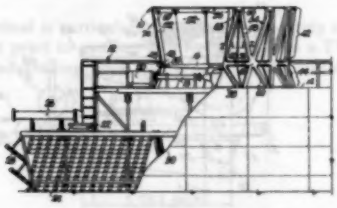
RIBBED FAN AIRFLOW STACK FOR WATER COOLING TOWER

Homer E. Fordyce, Kansas City, Mo., assignor to The Marley Company, Mission, Kans.

Filed Feb. 9, 1971, Ser. No. 113,857

Int. Cl. B01f 3/04

U.S. Cl. 261—109 7 Claims



A venturi-like airflow stack for induced draft water cooling towers employs a series of elongated, upright, longitudinally curved and transversely arcuate stave-like panels joined together by a series of releasable interconnections at their butt joints to form the wall of the stack. Each panel is provided with an external hoop length at the zone of greatest internal restriction; and opposed upper and lower V-shaped ribs having apexes which meet at a common junction with the respective hoop lengths. The hoop lengths and ribs are tubular in nature and are integral with the panels. Each hoop length is releasably coupled with its adjacent length and each leg of the upper ribs is releasably coupled with the proximal leg of the next adjacent panel for strengthening the wall and holding it against distortion.

3,781,000

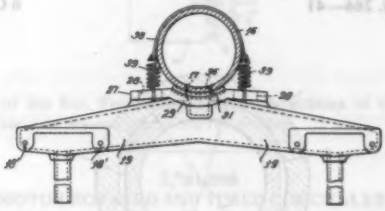
SPRING AND BOSS SPARGER-MOUNTING

Cornelis W. Paasschens, Schwalbach/Taunus, Germany, and Victor J. Nelson, Naperville, Ill., assignors to Chicago Bridge & Iron Company, Aurora, Ill.

Continuation of Ser. No. 845,377, July 28, 1969, abandoned. This application Oct. 18, 1971, Ser. No. 190,364

Int. Cl. B01f 3/04

U.S. Cl. 261—124 5 Claims



A single or double sparger unit is held accurately positioned on a header by the combination of a boss formed on the saddle portion of the sparger unit, and which projects into an aperture in the header through which air is supplied to the sparger unit, and a spring system embracing the header and drawing the sparger unit into sealed relationship with the header. A saddle shaped portion of the sparger unit, surrounding the boss, engages the header through a sealing gasket. The spring system includes one or more stainless steel spring fasteners. Each fastener includes a band with a spring at each end hooked through a hole in the band and hooked to the sparger unit

3,781,001

FEEDING ORES OR CONCENTRATES TO SMELTING FURNACES

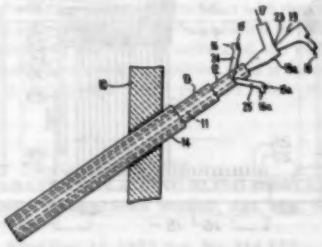
Barry Stewart Andrews, Glen Iris; Desmond Elwyn Fitzgerald, Blackburn, and Ian Edward Lewis, Valentine, all of Australia, assignors to Conzinc Riotinto of Australia, Limited, Melbourne, Victoria, Australia

Filed May 25, 1971, Ser. No. 146,670

Claims priority, application Australia, June 1, 1970, 1373/70

Int. Cl. C21b 7/16; C21c 5/48

U.S. Cl. 266—41 12 Claims



Method and apparatus for feeding particulate materials such as ores and/or concentrates and/or metal containing re-

treat materials, e.g., copper concentrate metal containing slags and the like to smelting and other furnaces. A stream of particulate material and oxygen-containing gas is delivered into the furnace through the first pipe, and a mixture of fuel and oxygen-containing gas is delivered through an annular space between the first pipe and a surrounding second pipe, the mixture of fuel and oxygen-containing gas being ignited as it enters the furnace so as to form a flame envelope surrounding the stream of particulate materials.

3,781,002

DUAL COAXIAL TUYERES

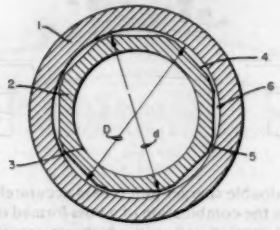
Camille Alphonse Courard, Angluer, Belgium, assignor to Centre de Recherches Metallurgiques, Brussels, Belgium

Filed Nov. 17, 1972, Ser. No. 307,697

Claims priority, application Belgium, Nov. 18, 1971, 775,527

Int. Cl. C21c *5/48*

U.S. Cl. 266—41 **6 Claims**



A dual coaxial duct tuyere for blowing oxygen and a protective fluid through the bottom of a metallurgical convertor, the outer duct being of a cylindrical shape and of dimensions adapted to receive the inner duct which has a circular passage coaxial with the outer cylinder and an external configuration comprised of at least six straight sides connected to each other by short arcuate sections, the length of each arcuate section being less than one-third the length of the straight sides.

3,781,003

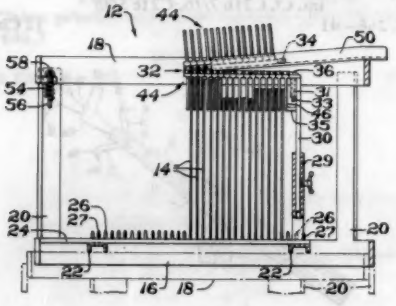
HANDLING GLASS-PLASTIC ASSEMBLIES

Willie G. DeAngelis, Brackenridge, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 12, 1972, Ser. No. 252,797

Int. Cl. B25b *1/20*; B32b *31/26*

U.S. Cl. 269—40 **7 Claims**



Apparatus for supporting a plurality of glass-plastic assemblies for lamination in an autoclave comprising bottom edge support structure including aligned bottom edge spacing elements, flexibly interconnected top edge engaging and spacing elements, and structure for making rigid the flexible interconnecting elements on which the top edge engaging and spacing elements are mounted.

3,781,004

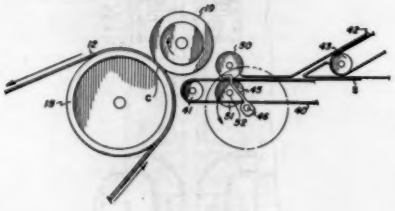
CONVEYING SYSTEM FOR ELECTROSTATOGRAPHIC PRINTING MACHINES

Gerald A. Buddendeck, Penfield; Lawrence C. Hubler, Fairport; Paul S. Heiler, Penfield, and Gilbert E. Koch, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1972, Ser. No. 284,829

Int. Cl. B65h *5/02*, *9/06*

U.S. Cl. 271—10 **2 Claims**



An electrostatographic printing machine employing sheet conveyance along a path through the machine from a supply source to a sheet output delivery point having at least two conveyor mechanisms adapted to convey sheets along the paper path each at a different speed and a switching device arranged between the two conveyor mechanisms operatively connected to a time sequence programming system which controls the feeding or introduction of sheets of paper from the supply point to the first of the conveyor mechanisms in the paper path.

3,781,005

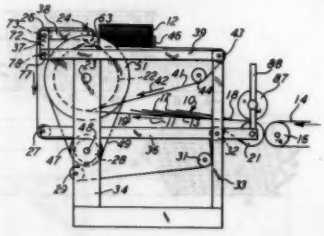
SHEET STACKER

Anton R. Stobb, and Walter J. Stobb, both of R.D. No. 1, Pittstown, N.J.

Filed Apr. 14, 1972, Ser. No. 244,199

Int. Cl. B65h *29/18*

U.S. Cl. 271—186 **6 Claims**



The sheet stacker having a supporting frame and two sets of conveyor belts for conveying a shingled stream of sheets therebetween and into an upwardly growing stack of sheets. One set of belts terminates adjacent the stack, and the other set of belts extends across the bottom of the stack to convey the sheets into the stack. A rotatable member exists at the terminal end of the one set of belts, and sheet-advancing

mechanism is mounted on and driven by the terminal end of the one set of belts to engage the stream of sheets and urge them into the stack. A pivotally mounted support arm mounts the terminal end of the one set of belts, and an adjustable support extends from the rotatable member and down to the stream for supporting the sheet-advancing means in an adjustable manner. The sheet-advancing mechanism is in the form of a roller, and small belts extend from the roller to the rotatable member on the terminal end of the one set of belts, for driving the roller and for engaging the stream to advance it into the stack. Adjustable support floors extend beneath the spaced-apart belts in the other set of belts for curving the stream as it approaches the stack, and the sheet-advancing means is therefore also adjustably mounted to be positionable along with the adjustment of the support floors.

3,781,006

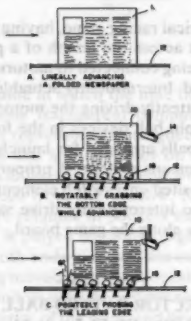
METHOD FOR SEPARATING PLURAL SHEETS

Charles H. Hart, Nazareth, Pa., and George R. Cashau, Philipsburg, N.J., assignors to American Newspaper Publishers Association Research Institute, Incorporated, Easton, Pa.

Division of Ser. No. 75,099, Sept. 24, 1970, Pat. No. 3,638,936. This application Nov. 15, 1971, Ser. No. 198,931

Int. Cl. B65h *3/32*

U.S. Cl. 271—18 R **1 Claim**


A LINEALLY ADVANCING A FOLDED NEWSPAPER
B ROTATABLY GRABBING THE BOTTOM EDGE WHILE ADVANCING
C POINTEDLY PROBING THE LEADING EDGE

Method of separating a bundle of plural sheets of material, such as a folded newspaper, including lineally advancing the bundle in a vertical plane, rotatably grabbing the bottom edges of said bundle during said advancing, and pointedly probing the leading edge of said bundle at the top during said advancing so as to separate said sheets laterally from said vertical plane.

The method is particularly adapted to separating a printed newspaper prior to stuffing with inserts such as a TV guide, classified advertising, book review supplements, and the like.

3,781,007

SECTIONAL, FOLDING, COMBINATION DUMBELL-BAR BELL

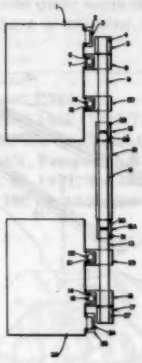
Richard E. Baker, and Elizabeth F. Baker, both of 2701 Arlington Blvd. No. 101, Arlington, Va.

Filed Nov. 1, 1972, Ser. No. 302,904

Int. Cl. A63b *11/02*

U.S. Cl. 272—84 **2 Claims**

A dumbell-barbell with two or more separate, collapsible containers which are filled as desired with fluid. These containers are suspended below opposite ends of a sectional bar to which they are fastened by bearings which allow the completely assembled sectional bar to rotate. The lateral movement of the containers is restricted by retainers on the ends of the bar. For compactness, the sections of the bar separate, and the containers are removable.



3,781,008

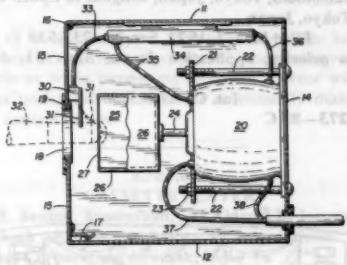
MOTOR ROTATED AND TIMED CUE CHALKER

Charles Espinoza, 1529 Tennyson, Denver, Colo.

Filed Aug. 21, 1972, Ser. No. 282,360

Int. Cl. A63d *15/16*

U.S. Cl. 273—19 **2 Claims**



A cue chalker comprising a housing and a block of chalk mounted in a holder rotated by a timed electric motor in the housing, the operation of the motor being started by switch means activated by a cue manually placed into contact with the chalk through an opening in the housing, and automatically stopped at the end of a predetermined time, such as 10 seconds, selected as the optimal time required for efficient chalking of a cue. The automatic stopping of the motor occurs regardless of whether the cue is in contact with the chalk. The switch means includes a starter device which is flexible to have wiping contact with the cue tip surface as the cue is being moved manually into chalking position, and is automatically returnable to its normal "off" position when the cue is withdrawn.

3,781,009

APPARATUS FOR AIDING BLIND BOWLERS

Leo Raymond Gagnon, 15505 Nordoff, Apt. 109, Sepulveda, Calif.

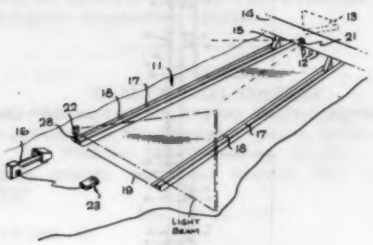
Filed Dec. 11, 1972, Ser. No. 314,127

Int. Cl. A63d *5/04*

U.S. Cl. 273—54 B **17 Claims**

Apparatus for aiding blind bowlers including a hand held unit incorporating position locating means utilizing a pair of

first optical sensors adapted to sense and actuate distinguishable non-visual signals in response to narrow beams of light directed along the imaginary center line and the foul line of the bowling alley, and pin indicating means in the form of



spring biased solenoid operated markers corresponding to the bowling pins and adapted to project from the face of the unit when second optical sensors mounted above the pins respond to light beams directed so as to be reflected into them by the standing pins.

3,781,010

BASKETBALL GAME AMUSEMENT DEVICE

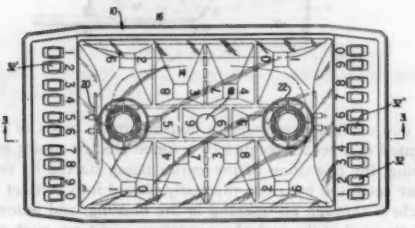
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed Mar. 7, 1972, Ser. No. 232,535

Claims priority, application Japan, Mar. 31, 1971, 46-24047

Int. Cl. A63f 7/06

U.S. Cl. 273—85 C **1 Claim**



A basketball game amusement device featuring a playing surface simulating a court and provided with a plurality of openings defining shooting positions. Elevated basket goals are located at each end of the playing surface. A plurality of rods are pivotably mounted below the playing surface, each rod terminating at one end in a button which when depressed raises the flange of the opposite end upwardly through one of the openings. As the ball falls into one of the openings within the playing surface, each of the players depresses his button corresponding to the opening causing the flanges of the rods to move upwardly within the opening to strike the ball. Each player fights for position to either use the flange of his rod to shoot the ball into his opponent's basket or block his opponent's shot. The buttons of each player are numbered to correspond to the openings within the playing surface. A clear plastic cover or dome keeps the ball in play.

3,781,011

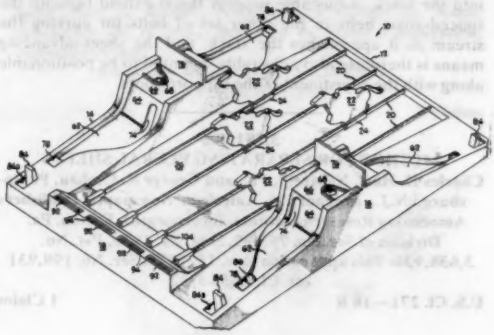
GAME WITH RACE FIGURE MOVEMENT DETERMINED BY PROJECTILE PROJECTING SKILL

Gordon A. Barlow, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 14, 1971, Ser. No. 207,894

Int. Cl. A63f 9/14

U.S. Cl. 273—86 G **2 Claims**



An electromechanical racing game, having figures mounted for linear movement across the length of a game board with each of the figures being connected to motors for driving them along the game board. Intermittently actuable switch means is provided for intermittently driving the motors to propel each of the figures, with pin ball devices in the form of launching plungers and game balls arranged for launching towards said intermittent switch means so that, if properly launched, the pin balls will be deposited on a switch element which will close said switch means to intermittently drive said motor to advance a related figure along the game board.

3,781,012

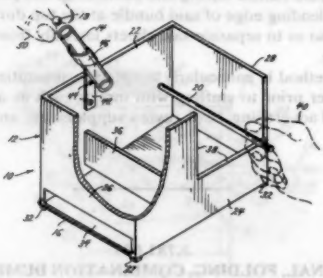
GRAVITY PROJECTOR BATTED BALL APPARATUS

Gary R. Slane, 12667 Olive St., St. Louis, Mo.

Filed Apr. 7, 1971, Ser. No. 131,557

Int. Cl. A63b 71/02

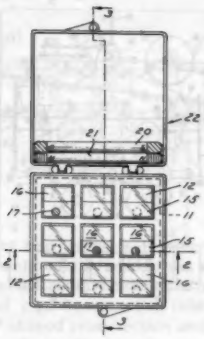
U.S. Cl. 273—95 R **7 Claims**



A game designed to use relatively small objects in a manner requiring direct action on the part of a participant or player challenging to finger dexterity, hand and eye coordination, and three-dimensional vision. A small open-top box adapted to be disposed on a table, and the like, is provided with an upwardly extending tube to receive a small ball dropped by one hand of a participant. The tube directs the ball into an area of the box to be struck by a pencil or similar bat held by the other

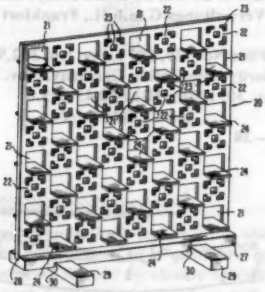
hand of a participant and extending through an opening in one side of the box. In the box is a partition or barrier over which the participant attempts to bat the ball as it drops from the tube. A ball return is provided.

3,781,013
MAGNETIC TIC-TAC-TOE GAME
Walter G. Von Meyer, 1504 Port Jefferson Rd., Sidney, Ohio
Filed Jan. 31, 1972, Ser. No. 222,130
Int. Cl. A63f 9/00
U.S. Cl. 273—130 B **5 Claims**



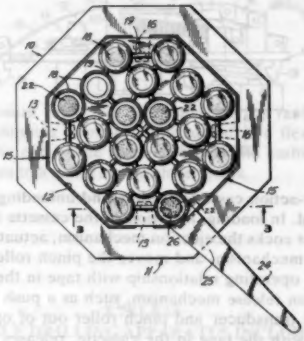
A tic-tac-toe game in which the nine tic-tac-toe squares are represented by nine transparent compartments and the tic-tac-toe indicia are represented by magnetized discs having one color on one side and another color on the other side. Each compartment includes a transparent window and a pocket beneath and spaced from the window. Normally the colored magnetic discs are retained in pockets under transparent windows. The game is played by using magnetic wands having a color at one or both ends to match the colors of the magnetic discs, a disc being moved from its concealed position to a position under the window with the proper color corresponding to the color and polarity of the wand end being used.

3,781,014
UPRIGHT CHECKERS AND CHESS GAME APPARATUS
Stanley J. Kolwicz, 16 Sanford Ave., Emerson, N.J.
Filed July 3, 1972, Ser. No. 268,887
Int. Cl. A63f 3/02
U.S. Cl. 273—131 AC **10 Claims**



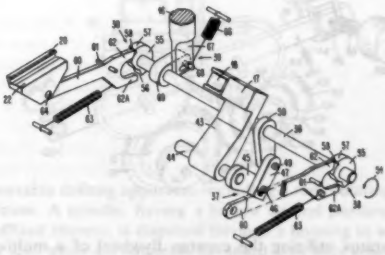
A game apparatus particularly for checkers and chess is constructed to allow movement of the game pieces in a vertical plane while providing horizontal supporting surfaces therefor. Two or four people may play the game utilizing one or both sides of an upright game board. The apparatus is readily knocked down for convenient packaging and shipment and features detachable game piece support members or shelves. The apparatus may have a swiveled base for added convenience.

3,781,015
MAGNETIC GAME CONSTRUCTION
Julius Ellman, 1672 E. 7th St., Brooklyn, N.Y., and George Lerner, 12 Prospect Ct., Freeport, N.Y.
Filed Dec. 29, 1971, Ser. No. 213,493
Int. Cl. A63f 9/08
U.S. Cl. 273—153 R **10 Claims**



A pair of lower and upper members, the latter having an array thereon of enclosures for spacedly containing respective magnet pieces while permitting inversion thereof within the enclosures under the influence of a manually manipulated magnetic control device.

3,781,016
CASSETTE PLAYER
Kenneth E. Benton, Broomfield, and Vincent L. Jacques, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 10, 1971, Ser. No. 122,890
Int. Cl. G11b 5/00
U.S. Cl. 274—4 C **30 Claims**



A cassette is loaded and ejected by a single-action mechanism. In loading, insertion of the cassette into the cassette player substantially simultaneously cocks the ejection mechanism, actuates a cassette holddown mechanism, and moves the pinch roller and transducer into a tape-operating relationship. A single-action release mechanism, such as a

push button, substantially simultaneously moves the transducer and pinch roller out of operative engagement with the tape in the cassette and releases and ejects the cassette.

3,781,017

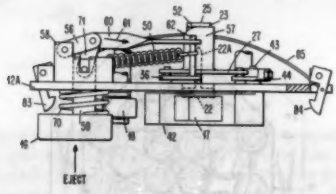
CASSETTE PLAYER

Douglas S. Baldwin, Longmont; Kenneth E. Benton, Broomfield, and Vincent L. Jacques, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1971, Ser. No. 122,891

Int. Cl. G11b 5/00

U.S. Cl. 274—4 C **8 Claims**



A single-action cassette loading and unloading mechanism is disclosed. In loading, insertion of the cassette into the cassette player cocks the ejection mechanism, actuates a cassette holddown mechanism, and moves the pinch roller and transducer into operating relationship with tape in the cassette. A single-action release mechanism, such as a push button, first moves the transducer and pinch roller out of operative engagement with the tape in the cassette, releases the cassette for ejection, and then ejects the cassette. Pivot axis of the mechanism is perpendicular to the plane of the cassette-receiving platform. A single extension spring is used to actuate mechanisms in response to a release actuation while another spring responds to cassette insertion for the single-action loading.

3,781,018

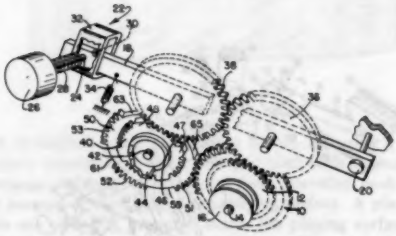
TAPE HEAD INDEXING AND SHIFTING APPARATUS

Thomas C. Cayton, Jr., Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 4, 1971, Ser. No. 186,160

Int. Cl. G11b 5/56

U.S. Cl. 274—4 A **4 Claims**



Apparatus utilizing the capstan flywheel of a multi-track tape recorder and/or reproducer to power apparatus for shifting the transducer head from one tape track to another, including gear means linking the flywheel to the cam which shifts the position of the transducer head, and a solenoid activated at the end of a tape track, causes engagement of the gear linkage, and means for automatically disengaging the shifting apparatus after the transducer head has been shifted and readying the same for future shifting.

3,781,019

AUTOMATIC CONTINUOUS RECORD/PLAYBACK MEANS FOR TAPE CASSETTE LOADING TAPE RECORDER

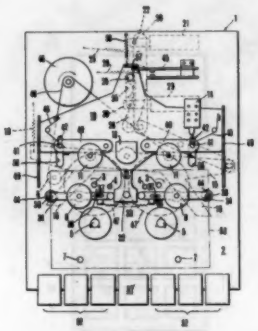
Junjiro Kikuchi, Nagano, Japan, assignor to Sankyo Kogaku Koygo Kabushiki Kaisha, Suwa-shi, Nagano, Japan

Continuation-in-part of Ser. No. 15,096, Feb. 27, 1970, abandoned. This application May 17, 1972, Ser. No. 254,208

Claims priority, application Japan, Feb. 28, 1969, 44-18659

Int. Cl. G11b 5/00

U.S. Cl. 274—4 E **7 Claims**



An automatic continuous record/playback means for a cassette tape recorder in which a magnetic tape provided with a plurality of tape tracks may be used for continuous reproduction, without having to turn the tape cassette over either manually or automatically on a multi-track replay equipment that has two capstans and two pressure rollers. Reproduction of all tracks is obtained by reversing the direction of tape travel. The automatic continuous record/playback means of the present invention principally comprises a pair of opposed pressure rollers and an elongated rocker arm member supported at its center on the tape recorder housing in a freely rockable manner in opposite directions. A rocking movement of the lever member around its pivotal point in either desired direction causes a respective pressure roller to selectively make engagement with its co-operable capstan so that the tape is advanced in a selected direction of travel. Head channels in the magnetic head may be alternatively brought into co-operation with any one of tape tracks, selected in accordance with the direction of the tape movement.

3,781,020

DIAMOND STYLUS FOR DISC RECORDS

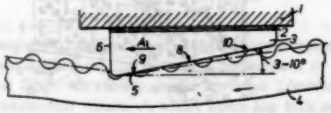
Helmut Batsch; Benno Jahnel, both of Berlin; Ernst August Weinz, Idaroberstein; Wolfgang Berger, and Gerhard Dickopp, both of Berlin, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfort am Main, Germany

Filed Nov. 29, 1971, Ser. No. 202,988

Claims priority, application Germany, Nov. 30, 1970, P 20 60 317.2; Nov. 30, 1970, HGM 70 45 295.8

Int. Cl. G11b 3/44

U.S. Cl. 274—38 **15 Claims**



A pressure scanning diamond stylus having an elongated lower edge in a wear resistant crystallographic orientation.

3,781,021

FLAME RESISTANT SEALS

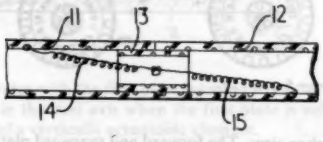
Richard N. Thomson, Markfield, near Leicester, and Michael F. Walker, Leicester, both of England, assignors to Dunlap Holdings Limited, London, England

Filed Aug. 23, 1971, Ser. No. 173,873

Claims priority, application Great Britain, Aug. 26, 1970, 40,920/70

Int. Cl. F16j *15/12*

U.S. Cl. 277—164 9 Claims



A flame-resistant seal which is transversely stiff and resistant to kinking and buckling made from a layer of asbestos fabric and a layer of metal braid embedded in a flame-resistant polymeric material, e.g., fluorocarbon rubber. The seal may have a round or P-shaped cross-section and may form a continuous loop; it may form a flame-resistant cover for a hose or a wire.

3,781,022

PISTON RING AND CYLINDER LINER HAVING MINUTE OIL-RETAINING INDENTATION

Junichiro Kumabe, Tokyo, and Koichi Shimuzu, Okaya, both of Japan, assignors to Rikagaku Kenkyusho, Wako-shi, Saitama-ken and Teikoku Piston Ring Co., Ltd., Tokyo, both of Japan

Filed Nov. 30, 1970, Ser. No. 93,568

Claims priority, application Japan, Dec. 1, 1969, 44/95716; Dec. 1, 1969, 44/95717

Int. Cl. F16j *9/12, 11/04*

U.S. Cl. 277—213 5 Claims

A piston ring or cylinder liner having on its sliding surface numerous minute indentations in a geometric grid pattern, said indentations being formed by closely spaced continuous helical grooves each formed in said surface with a repetitive depth variation to form thereby closely spaced successive ridges and valleys in each groove and with the spacing between successive of said ridges being less than the groove width.

3,781,023

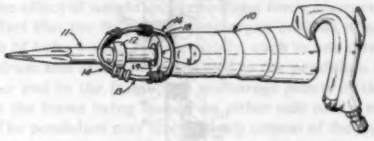
SAFETY RETAINER FOR COLLARED CHISELS IN CHIPPING HAMMERS

James C. Boyd, c/o Tool Sales & Services Co., 1137 Electric Ave., Franklin Township, Westmoreland County, Pa.

Filed July 18, 1972, Ser. No. 272,783

Int. Cl. B25d *17/10*

U.S. Cl. 279—19.6 2 Claims



This disclosure relates to a retainer for the reciprocating chisel of a chipping hammer, constructed as a flexible sling secured to the end of the hammer barrel and embracing the chisel adjacent to a collar on the chisel shank.

3,781,024

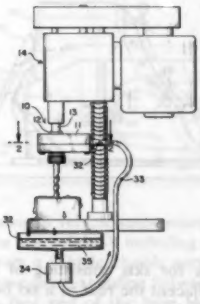
PORTABLE DRILLING APPARATUS INCLUDING A MECHANICAL, RECIRCULATING COOLING SYSTEM

Herman Ganser, 8353 264th St., Floral Park, and Alfred Ganser, 86-09 208th St., Queens Village, both of N.Y.

Filed July 31, 1972, Ser. No. 276,476

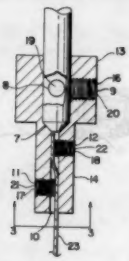
Int. Cl. B23b *51/06, 31/02*

U.S. Cl. 279—20 7 Claims



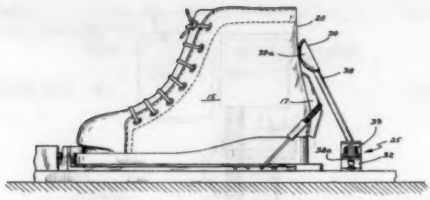
A portable drilling apparatus including a recirculating cooling system. A spindle, having a hollow central portion and a gear affixed thereto, is disposed through a housing in which a pair of idler gears are rotatably mounted. The idler gears mesh with the drive gear, and when the spindle is rotated, cooling liquid is drawn in through inlet passages by the suction created by the meshing gears. The liquid is pumped into the hollow spindle, and through a pair of longitudinally extending parallel apertures provided in a drill bit secured in the end of the spindle. The fluid is caught in a sump disposed below the material being drilled, and is pumped through a filter and hose coupling back to the housing by the gears.

3,781,025
RECIPROCATING SAW CHUCK
Nicola D'Angelo, 41 Washington St., Norwich, Conn.
Filed Feb. 1, 1972, Ser. No. 222,573
Int. Cl. B23b 31/10
U.S. Cl. 279—83 **2 Claims**



A chuck for flat saw blades to be mounted on reciprocating shafts of the sabre saw type and having two set screws on opposite sides of the chuck and longitudinally spaced from each other to force a slight "S" bend in the saw blade.

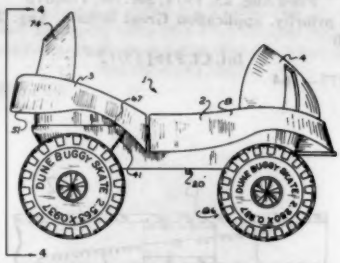
3,781,026
SKI STOPPING STRUCTURE
Boyd L. Bovee, Box 268, Conde, S. Dak.
Filed Nov. 17, 1972, Ser. No. 307,592
Int. Cl. A63c 7/10
U.S. Cl. 280—11.13 B **4 Claims**



A stop structure for skis consisting of a plate member secured to a ski adjacent the rear of a ski boot, a spring tensioned arm journaled in said plate member, said arm being adapted to swing forwardly outwardly of the ski in the direction of said boot and said arm in operative cocked position bearing against the upper heel portion of said ski boot.

3,781,027
SELF BIASING ROLLER SKATE
Beverly W. Taylor, Hermann, Mo., assignor to Steven Manufacturing Co., Hermann, Mo.
Filed Sept. 27, 1971, Ser. No. 183,790
Int. Cl. A63c 17/02
U.S. Cl. 280—11.26 **13 Claims**

An adjustable length skate, preferably plastic, is provided having an improved construction for biasing those sections of the skate which grip the shoe of the wearer. The skate is a two piece platform, each platform being mounted on an axle-wheel assembly. The platforms are adjustable longitudinally with respect to one another and can accommodate a plurality



of wearer shoe sizes. The forward and rearward platforms also are biased with respect to one another. Biasing permits the skate to grip the shoe after insertion into the skate structure.

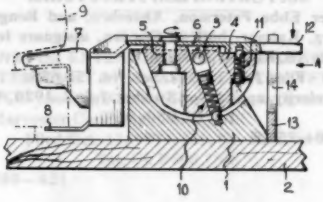
3,781,028
SAFETY SKI BINDING
Ernst Gertsch, Sparthaus Central, Wengen, and Ulrich Gertsch, 461 G Aenderbergstrasse, Matten, Interlaken, both of Switzerland
Filed Aug. 3, 1971, Ser. No. 168,561
Claims priority, application Switzerland, Aug. 6, 1970, 11857/70
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 K **4 Claims**

A safety ski binding embodying a release plate intended to be fixedly retained at the ski boot and which can be locked with the ski through the agency of locking pins. According to important aspects of this invention it is contemplated that at the region of at least one end of the release plate there are provided two locking pins disposed adjacent one another to both sides of the central lengthwise axis of the associated ski, these pins cooperating with recesses provided at the relevant end of the release plate in such a manner that during sideward release of the release plate only always one of both locking pins comes into operable play, yet upon loading the release plate towards the top and in the lengthwise direction of the ski both locking pins come into play.

3,781,029
SKI ATTACHMENT
Georges Pierre Joseph Salomon, 34 Avenue de Loverchy, Annecy, France
Filed Nov. 26, 1971, Ser. No. 202,121
Claims priority, application France, Dec. 3, 1970, 7043513
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **8 Claims**

A safety attachment for holding a boot onto a ski including a jaw portion which is subjected to the action of at least one releasable locking device allowing the jaw to open in a vertical

and in a substantially horizontal plane. A first plate member is connected to the jaw and is displaceable laterally therewith; a second plate member is fixed in the longitudinal axis of the ski



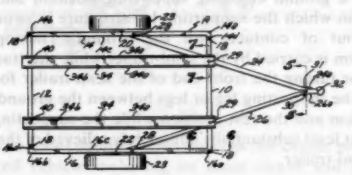
and cooperates with the first plate member to cause the return of the jaw in the said axis when the first plate is subjected to the action of a vertically actuatable element.

3,781,030

POWER DRAWN COLLAPSIBLE TRAILER

Palmer J. Ekedal, 18721 LaGuardia St., Rowland Heights, Calif.

Filed Aug. 30, 1972, Ser. No. 285,080
Int. Cl. B60p 3/06
U.S. Cl. 280—36 C **4 Claims**



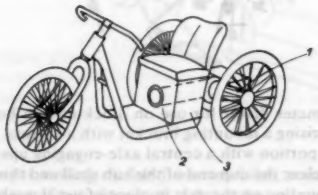
A trailer that includes a rectangular, load supporting frame that is defined by forward and rearward end pieces pivotally connected to first and second L-shaped side pieces. Two stub shafts that are longitudinally spaced from one another project from the center portions of the side pieces, and rotatably support two pneumatic tired wheels.

3,781,031

THREE WHEELED VEHICLES HAVING STATIC AND DYNAMIC EQUILIBRIUM

Pierre Patin, 58, rue de Serves 92, Boulogne-sur-Seine, France

Filed Sept. 26, 1972, Ser. No. 292,296
Claims priority, application France, Oct. 1, 1971, 71.35441
Int. Cl. B62d 61/06
U.S. Cl. 280—62 **8 Claims**



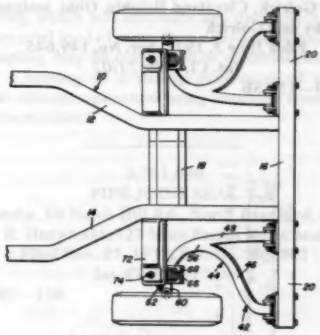
A three-wheeled vehicle having a frame symmetrical relative to a median plane and carrying a forward guiding wheel mounted, in the said median plane, on a fork with positive castor, a rear framework comprising two wheels mounted on an axle on either side of the median plane of the frame, an organ for pivoting the frame relative to the rear framework, comprising a cylindrical bearing rigidly attached to the framework and having an axis which is substantially horizontal and positioned in the median plane, and on which pivots a coaxial, cylindrical part, connected to the frame, and a device for locking the pivoting organ comprising a drum rigidly connected to the framework and coaxial with the cylindrical bearing and an organ for locking on the drum by friction, operated by a pendulum oscillating on either side of the median plane under the effect of weight and centrifugal force, characterized by the fact that the friction locking organ consists of at least one pair of belts wound symmetrically, each in one direction, on the drum and attached at one end to the pendulum and at the other end to the frame, the anchorage points of the said belts on the frame being spaced on either side of the median plane. The pendulum may alternatively consist of the frame of the vehicle itself, the said frame being suspended from a yoke positioned inside the housing and mounted pivotably on the cylindrical bearing, by means of at least one pair of suspension arms, positioned symmetrically each on one side of the median plane and each hinged about two axes parallel to the median plane, at their lower portion to the bottom of the housing and at their upper portion to the yoke.

3,781,032

TRAILING ARM SUSPENSION SYSTEM

Vincent Jones, 343 W. 3rd St., Tooele, Utah

Filed Apr. 24, 1972, Ser. No. 246,849
Int. Cl. B60g 11/16
U.S. Cl. 280—124 A **10 Claims**



A generally Y-shaped vehicle suspension support arm with the free ends of the arms of the Y including structure for oscillatable support from a vehicle chassis portion about aligned horizontal transverse axes extending between the free ends of the Y arms. The free end of the base leg of the Y-shaped suspension arm curves laterally in the plane containing the arms of the Y and includes structure on its terminal end for oscillatably supporting a wheel spindle therefrom.

3,781,033

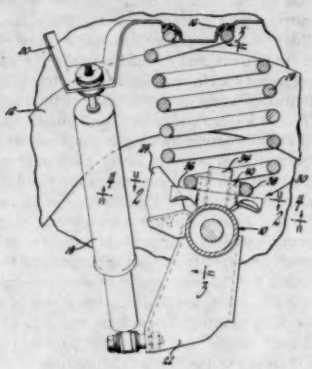
VEHICLE HEIGHT ADJUSTING SUSPENSION ARRANGEMENT

Robert M. Buchwald, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1972, Ser. No. 304,767
Int. Cl. B60g 11/16
U.S. Cl. 280—124 R **4 Claims**

Suspension systems for automotive vehicles of the type employing primary coil suspension springs between the sprung

and unsprung masses are adapted for adjustment of the local suspension height and vehicle attitude or trim by including at either or both of the front and rear suspensions lower spring seats having one surface engaged by the lower end of the coil



spring and an opposite surface having several pairs of particylindrical seat faces complementary to the supporting axle housing or the like, the seats being rotatable to different orientations on the axle to select different amounts of elevation of the lower end of the spring.

3,781,034

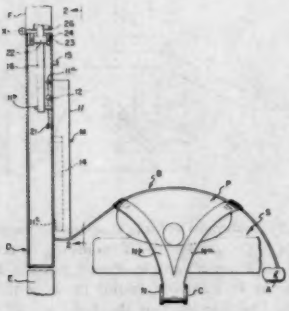
VEHICLE SAFETY HARNESS RIGGING

Irlin Botnick, 3155 Kersdale Rd., Pepper Pike, Ohio, and Philip D. Golrick, Cleveland Heights, Ohio, assignors to said Botnick, by said Golrick

Filed June 3, 1971, Ser. No. 149,645

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **9 Claims**



A forwardly swinging and hinged automobile door secures one end of a belt portion of safety strap rigging for an adjacent seat position by door mounted mechanism including a linkage engaging a door-framing fixed part of the vehicle; whereby the belt strap portion proximate the door space, with any shoulder strap connected thereto, is swung away from the seat upon door opening to facilatate entering and leaving the seat, and upon door closing is brought automatically into proper passenger restraining disposition relative to the seat. One end of the belt strap (and a ceiling-anchored end of any belt connected shoulder strap) is secured reeled on a respective strap and anchoring reel allowing normal movement of a person in the seat, but locking up the belt end, upon sudden vehicle deceleration either by incipient rapid payout under body exerted force on the belt or by a deceleration-sensing inertial lock in the reel.

3,781,035

SUPPORTING LEG STRUCTURES

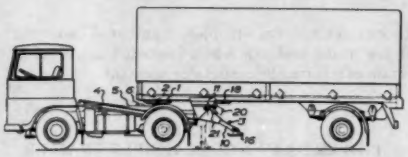
Ralf Krister Ebbe Petersson, Alsterbro, and Bengt Roland Holmberg, Kalmar, both of Sweden, assignors to Kalmar Verkstads AB, Kalmar, Sweden

Filed July 1, 1971, Ser. No. 158,685

Claims priority, application Sweden, July 2, 1970, 9174/70

Int. Cl. B60s *9/10*

U.S. Cl. 280—150.5 **3 Claims**



A semi-trailer supporting leg structure is mounted so as to permit pivotment by means of an operating mechanism between a ground engaging supporting position and a rest position in which the supporting leg structure is swung rearwardly out of contact with the ground. The operating mechanism is carried by the semi-trailer while the tractor has means for raising the front end of the semi-trailer for pivotment of the supporting leg or legs between the ground engaging position and the rest position while the supporting leg or legs are at least substantially completely relieved of the weight of the semi-trailer.

3,781,036

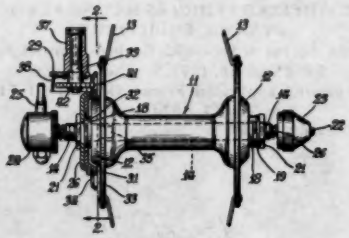
SPEEDOMETER DRIVER FOR BICYCLE QUICK-RELEASE HUBS

Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Nov. 6, 1972, Ser. No. 304,070

Int. Cl. B62k *3/00*

U.S. Cl. 280—289 **3 Claims**



Speedometer driver for use on quick-release hubs of bicycles comprising a mounting bracket with a vertical part having a circular portion with a central axle-engaging aperture offset axially to clear the cup end of the hub shell and thin enough to permit mounting on the axle in place of usual washer between adjacent cone and lock nut as a permanent part of the quick-release hub, key means on the axle-engaging portion of bracket cooperating with keyway on axle, dished bearing ring nested into and secured to offset portion of bracket with inner

diameter larger than outer diameter of cone, a stamped driving gear having annular hub rotatably mounted on bearing ring between marginal portion thereof and mounting bracket, and the latter having a shelf portion extending at right angles to rotatably support a cable-rotating fitting and a plastic pinion actuated by the driving gear.

3,781,037

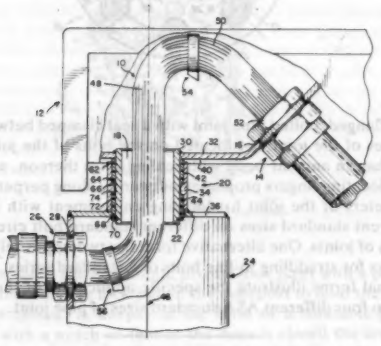
MEANS FOR EXTENDING WIRES THROUGH THE CENTER PIVOT OF AN ARTICULATED VEHICLE

Arthur J. Czajkowski, North Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,044

Int. Cl. B60d *1/08*

U.S. Cl. 280—421 **1 Claim**



A means for extending wires through the center pivot of an articulated vehicle including an inner sleeve and an outer sleeve with a pair of bushings trapped therebetween to permit a bundle of wires to extend therethrough whereby the life of the wires is enhanced.

3,781,038

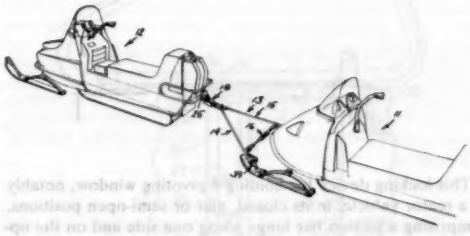
TOW BAR FOR TOWING DISABLED SNOWMOBILES

Francis D. Bachel, and Robert A. Voves, both of Hibbing, Minn., assignors to E-Z Tow, Inc., Hibbing, Minn.

Filed June 12, 1972, Ser. No. 261,604

Int. Cl. B62d *13/00*

U.S. Cl. 280—493 **6 Claims**



Apparatus for towing disabled snowmobiles, comprising a triangular frame of two elongated rod members pivotally connected at their forward end and an extensible adjusting member transversely connected therebetween. One end of the extensible member is removably connected to permit collapse of the frame when not in use. Each of the rod members pivotally carries at its rearward end a slotted member constructed and arranged to receive and retain the edge of a snowmobile ski. A ball hitch disposed at the forward end pivotally connects the apparatus to a towing snowmobile.

3,781,039

COUPLINGS

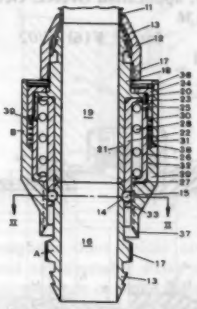
Walter Frederick Locke, Emsworth; Ernest Arthur Watson, Bedhampton, and Thomas Philip Edwards, Farehem, all of England, assignors to F.P.T. Industries Limited, Portsmouth, Hampshire, England

Filed Aug. 2, 1971, Ser. No. 168,206

Claims priority, application Great Britain, Aug. 12, 1970, 38,776/70

Int. Cl. F16l *37/00*; F17d *1/00*

U.S. Cl. 285—1 **2 Claims**



A coupling which will automatically disconnect when subjected to an axial load of more than a predetermined amount.

The coupling may be connected or disconnected manually by either a turning or a sliding movement of an external sleeve, this manual operation being separate from the automatic disconnection.

3,781,040

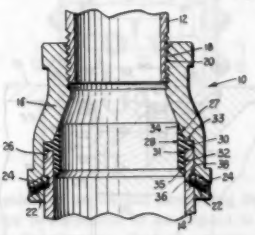
PIPE JOINT SEAL

John A. Lasko, 50 Notch Hill Rd., North Branford, Conn., and Elwood R. Horwinski, 727 Moss Farms Rd., Cheshire, Conn.

Filed Nov. 27, 1972, Ser. No. 309,902

Int. Cl. F16l *17/00*

U.S. Cl. 285—110 **6 Claims**



A pipe joint seal for coupling two adjacent ends of aligned pipe sections, the seal comprising an annular fitting member internally threaded at one end to receive a corresponding threaded end of one pipe section, and an annular resilient sealing ring having an external annular flange, the ring being carried in the bore of the fitting and being adapted for engagement with the end of the second pipe section. The ring com-

prises a cylindrical body portion extending on opposite sides of the flange, the body portion being for sealing engagement with the bores of the fitting and of the second pipe section such that the internal pressure of fluid carried by the pipe tends to cause radial expansion of the ring into forcible engagement with the bores. The fitting has a plurality of substantially radially extending holes in which there are received set screws, which can engage external shoulders of the second pipe section after the latter is received in the bore of the fitting, to force and maintain together the fitting and the second, unthreaded pipe section.

3,781,041

PIPE AND TUBE COUPLING

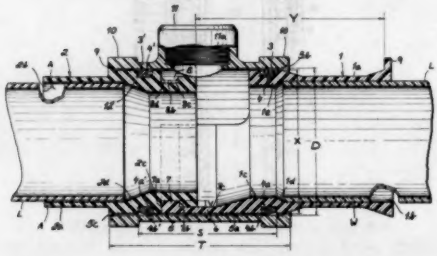
Aristovoulos G. Petzetakis, Thessaloniki & Chandri St., Moschaton/Piraeus, Greece

Filed Sept. 14, 1971, Ser. No. 180,299

Claims priority, application Greece, Oct. 31, 1970, 44019; Apr. 7, 1971, 45136

Int. Cl. F16l *17/02*

U.S. Cl. 285—111 **4 Claims**



A pipe and tube coupling arrangement in which two coupling members are provided with transversely interfitting formations resisting axial separation and are thereby brought into axial alignment. A sleeve can then be axially shifted over the joint to prevent transverse separation. The coupling members are provided with annular grooves which receive respective sealing glands bearing outwardly upon the sleeve.

3,781,042

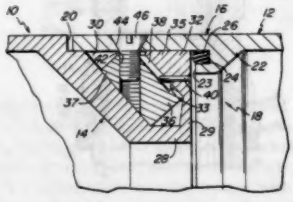
JOINT HAVING FORCE CONVERTING MEANS

Raymond J. Estlick, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 30, 1970, Ser. No. 76,844

Int. Cl. F16l *19/06*

U.S. Cl. 285—339 **2 Claims**



A joint comprising two parallel walls, one of which has a through hole aligned with a cavity in the other wall, and a fastening device extended through said hole and into said cavity to engage force-converting means whereby one wall is pulled radially toward the other and simultaneously moved parallel thereto.

3,781,043

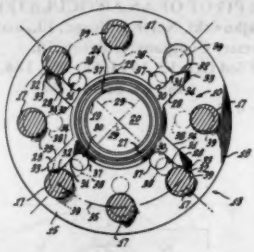
MULTIPLE PIPE JOINT SEAL

Foster M. Hagmann, 130 N. Bristol Ave., Los Angeles, Calif.

Filed Jan. 17, 1972, Ser. No. 218,363

Int. Cl. F16l *17/00*

U.S. Cl. 285—363 **11 Claims**



A flanged, bolted pipe joint with a seal clamped between the flanges of the joint and located on the bolts of the joint. The seal has an annular body with sealing rings thereon, and with four locating fingers projecting outwardly along perpendicular diameters of the joint for locating engagement with bolts of different standard sizes on different standard bolt circles of a series of joints. One alternative form has two oppositely facing fingers for straddling in-line bolts of a standard series, and additional forms illustrate the specific application of the invention to four different ASA standard sizes of pipe joint.

3,781,044

PIVOTING WINDOW LOCKING DEVICES

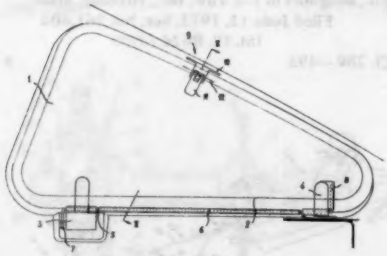
Marcel Quesnel, and Jean Guerin, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed May 1, 1972, Ser. No. 249,145

Claims priority, application France, May 10, 1971, 7116773

Int. Cl. E05c *3/06*

U.S. Cl. 292—200 **7 Claims**



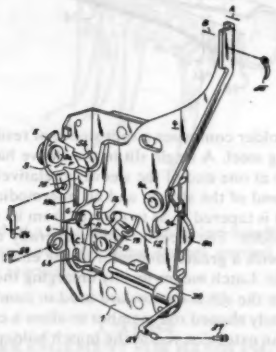
This locking device for holding a pivoting window, notably of a motor vehicle, in its closed, ajar or semi-open positions, comprising a torsion bar hinge along one side and on the opposite side said locking device, consists essentially of a three-lug member pivotally mounted about an axis parallel to said opposite side to the window frame, a first lug acting as a control lug, the second lug being substantially perpendicular to said first lug and adapted to retain the window ajar, the third lug acting as an intermediate locking lug driven with a moderate clearance and adapted to retain the window in its closed position, and resilient means normally urging said third lug in its locking position.

3,781,045

MOTOR-VEHICLE DOOR LATCH WITH LOCK MECHANISM ONLY ACTUATABLE WITH DOOR CLOSED

Hans-Dieter Watermann, Metzkausen, Germany, assignor to Arn. Kiekert Sohne, Heiligenhaus, Germany

Filed Jan. 24, 1972, Ser. No. 220,037
Claims priority, application Germany, Jan. 26, 1971, G 71 02 692.1; May 18, 1971, G 71 19 458.6
Int. Cl. E05c 3/26
U.S. Cl. 292—216 6 Claims



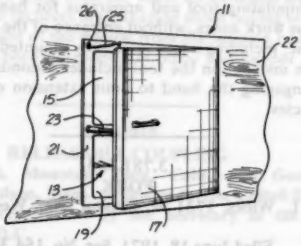
A door latch has a bifurcate pivotal lock pawl with a pair of arms embracing the lock pin on the doorpost to hold the vehicle door closed. A keeper in the form of a rotatable pin is formed with a notch so that as the door is closed the arms of the pawl in turn cam the keeper around and lodge behind this keeper. The keeper can be rotated both from inside and outside the vehicle to clear the arms of the pawl and enable the door to open. Similarly a lock mechanism can prevent the door-opening mechanism from functioning. The keeper fixedly carries a crank arm having a projection which prevents the lock mechanism from working in all but the closed position of the door to prevent the user from locking his keys in the vehicle. The arms of the pawl serve to arrest the keeper in different angular positions to effect this safety measure.

3,781,046

REFRIGERATOR DOOR SHOCK ABSORBER

Joseph D. Hinkle, Rowland Heights, Calif., assignor to Dam Fine Products Corporation, El Monte, Calif.

Filed Dec. 23, 1971, Ser. No. 211,597
Int. Cl. E05c 17/12, 17/36
U.S. Cl. 292—264 4 Claims



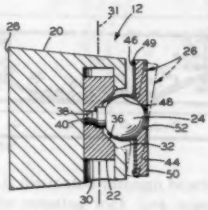
A shock absorbing device for use in holding open a door of a container in a vehicle including resilient means positionable between the door and an abutment for holding the door in an open position and connector means for preventing the door from opening more than a predetermined amount. The connector means allows the door to be opened less than said predetermined amount, and the resilient means is compressed between the door and the abutment even when the door is opened said predetermined amount.

3,781,047

ADJUSTABLE SUPPORT

Walter E. Surko, Jr., Southington, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Filed Mar. 31, 1972, Ser. No. 240,220
Int. Cl. E05c 17/56
U.S. Cl. 292—251.5 15 Claims



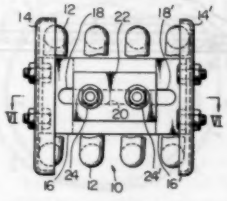
An adjustable magnetic door holder comprises an electromagnetic unit and an adjustable strike support which includes a base and an armature or strike plate. The strike plate is adjustably coupled to the base by a ball and socket joint carried by a cylindrical member supported for limited angular movement and axial translation relative to the base whereby wide variation of adjustment between the strike plate and base may be attained to facilitate precise alignment of the strike plate with the electromagnetic unit.

3,781,048

IMPACT ABSORBING DEVICE FOR BUMPERS

Masaaki Oguma, Tokyo, and Mitsugi Kurosaki, Yokosuka City, both of Japan, assignors to Nissan Motor Company Limited, Kanagawa-ku, Yokohama City, Japan

Filed Apr. 17, 1972, Ser. No. 244,649
Claims priority, application Japan, Aug. 27, 1971, 46/76758
Int. Cl. B60r 19/08; B60g 13/02
U.S. Cl. 293—89 10 Claims



The deformation of an impact absorbing device as caused when the device is subjected to an impact is restrained in a predetermined direction so that the device is capable of properly operating even though localized force or forces are imparted to the device. The impact absorbing device is made up of resilient spring means, a pair of support members holding the resilient spring means therebetween, and a pair of slide plates which project perpendicularly inwardly from the support members and which are clamped together in a manner to be slidable on each other so as to be moved in opposite directions when the resilient spring means is subjected to a

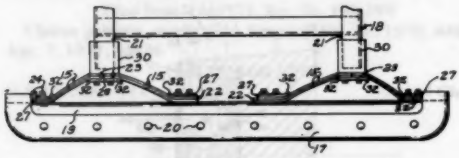
compressive stress and accordingly the spaced support members are moved toward each during a condition in which the device is encountering an impact. The device is usually combined with a fender to make up a bumper for vehicles.

3,781,049

RIGIDLY ATTACHED RESILIENT BUCKLING COLUMN BUMPER SUPPORT SYSTEMS

Ronald G. Cantrell, Birmingham, Mich., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Apr. 12, 1971, Ser. No. 133,137
Int. Cl. B60r 19/06
U.S. Cl. 293—99 **6 Claims**



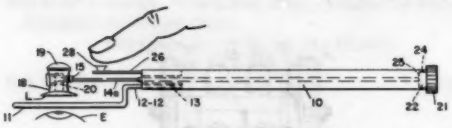
Resilient buckling column bars are rigidly attached to respectively a bumper and a support such as a vehicle frame for impact energy storing during displacement of the bumper relative to the support as permitted by the bars during impact force whereafter the bars return the bumper system to normal position. Ample support is provided by the bars to serve as the connecting structure between the bumper and the support without need for additional jacking bar connection.

3,781,050

EYE CONTACT LENS MANIPULATOR

Eugene S. Horres, 1736 Savanah Hwy., Charleston, S.C.

Continuation-in-part of Ser. No. 40,879, May 27, 1970, Pat. No. 3,645,576. This application Dec. 15, 1971, Ser. No. 208,156
Int. Cl. A61f 9/00
U.S. Cl. 294—1 CA **2 Claims**



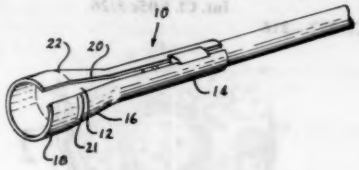
A device for inserting and removing a contact lens with respect to the eye. The device includes a tubular handle for mounting an oval loop to engage the eye lid to prevent eye blinking and a turnable control shaft with a flexible end portion extending from the handle for mounting a lens inserter and remover, and a finger activated spring filament to move the flexible end portion to and from the eye. The control shaft at the opposite end from the eye lid loop has keyed or secured to it a knurled knob with a reduced portion rotatable in the open end of the handle for turning the shaft and positioning the lens inserter and remover as desired. Also, the reduced portion of the knob includes a spring pressed ball to retain the shaft to its turned positions for lens insertion or lens removal.

3,781,051

MATCH HOLDER

James William Gibson, 811 3rd St., and James William Gibson, Jr., 1623 Coventry Rd., both of Massillon, Ohio

Filed Mar. 16, 1972, Ser. No. 235,246
Int. Cl. B25g 3/20
U.S. Cl. 294—1 R **1 Claim**



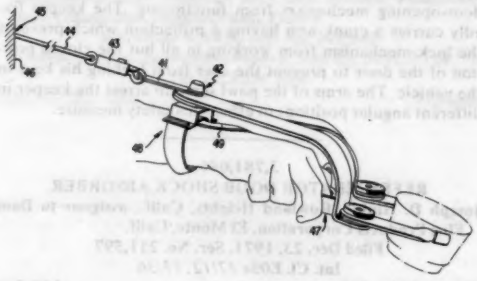
A match holder comprises a split sleeve of resilient material such as spring steel. A single slit in the sleeve has a relatively narrow width at one end of the sleeve, a relatively wide width at the other end of the sleeve, and an intermediate portion in which the slit is tapered so as to diverge from its narrow width to its wide width. The sleeve, while generally cylindrical, is constructed with a greater diameter at the end thereof where the slit is wide. Latch means locally enlarging the slit at a part thereof where the slit is narrow are used in combination with an appropriately shaped rod member to allow a convenient attachment of an extension rod to the match holder.

3,781,052

SAFETY APPARATUS

Robert G. Millington, Treichlers, Pa., assignor to Hims, Inc., Allentown, Pa.

Filed Apr. 3, 1972, Ser. No. 240,572
Int. Cl. B25b 7/04
U.S. Cl. 294—25 **9 Claims**



A manipulating tool and apparatus for handling items in hazardous work zones, without entrance of the hands into the work zone, including a tool releasably mounted on the human hand. On installation the tool includes secondary restraining means engaging the hand to limit extension of the hand in emergencies.

3,781,053

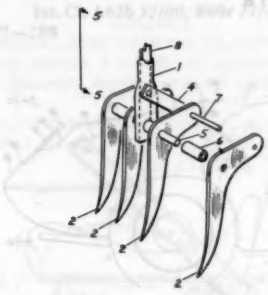
FORK

Norman L. Wicks, 1731 W. Capitol Ave., West Sacramento, Calif.

Filed June 18, 1971, Ser. No. 154,339
Int. Cl. A01d 9/02
U.S. Cl. 294—55.5 **3 Claims**

A sturdy earth working fork-type tool characterized by heavy-duty identical digging and uprooting tines. Each inverted L-shaped tine comprises a downwardly tapering flat-

faced pointed blade. The upper rearwardly angled head portions of the tines are apertured, bridge across and are operatively mounted on spaced parallel assembling and linking rods.



The lower end of a tubular but reinforced handle is joined to the forward rod and diverging braces carried thereby are secured to the rearward rod.

3,781,054

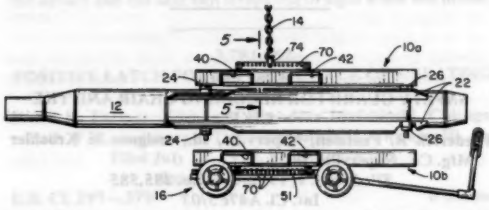
BEAM ARRANGEMENT FOR HANDLING HEAVY ELONGATE OBJECTS BY POWER MACHINERY

Clyde C. Cole, 5298 Harvard St., Ventura, Calif.

Filed Oct. 24, 1972, Ser. No. 299,994

Int. Cl. B66c *1/66*

U.S. Cl. 294—81 R **5 Claims**



A support beam arrangement for handling heavy, elongate objects such as missiles and rockets having easily damaged external surface areas and which may be sensitive to shock. The arrangement permits such objects to be handled either by a fork lift truck or by the hoist line of an overhead crane and is adapted to be carried upon a conventional missile transporting cart having spaced, upright, load-supporting rails. The invention arrangement locks onto the usual forward and aft missile support lugs and includes lug-engaging shoes having stops that prevent separation of the missile from the support beam once the missile has been positioned in place and keeper pins inserted.

3,781,055

RELEASABLE COUPLING

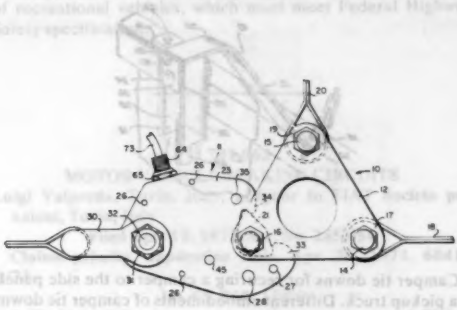
John D. Keich, Mountain View, Calif., and George A. Laliberte, Hudson, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 14, 1972, Ser. No. 271,954

Int. Cl. B64d *17/38*

U.S. Cl. 294—83 A **7 Claims**

An improved releasable coupling for releasably connecting the elements of a system under tension load, as in a system for extracting a heavy cargo from an aircraft. The improvement comprises a reciprocative toggle linkage for releasably locking a latch element in engagement with a rotatable cam in a link assembly, and a roller bearing locking means for releasably locking the toggle linkage until it is purposely unlocked by withdrawing the roller bearing locking means from engagement with a rotatable lock link of the toggle linkage. When unlocking of the releasable coupling occurs, the high energy



stored in the system is dissipated through bearing friction and air resistance on the rotating lock link together with the reciprocative but non-impacting action of the latch and the connecting rod which connects the latch to the lock link. Thus damage to the inner parts of the latch assembly of the releasable coupling is minimized since the impacting of internal parts occurring in prior releasable couplings is eliminated.

3,781,056

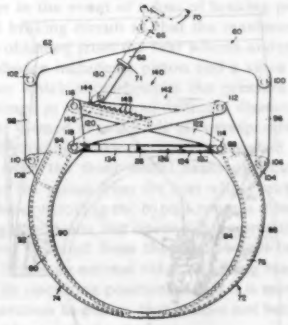
LOGGING GRAPPLE

Neil Edward Ransford, Dubuque, Iowa; Leland Glen Gilbert, Moerfelden, Germany, and Richard Herman Hunger, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 12, 1971, Ser. No. 188,397

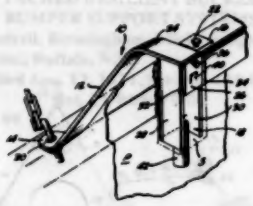
Int. Cl. B66c *1/42*

U.S. Cl. 294—112 **15 Claims**



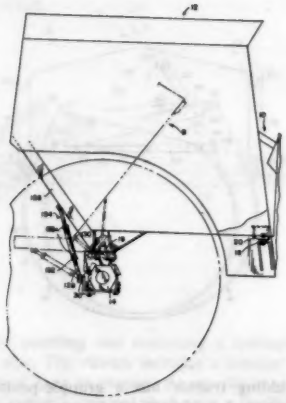
A log skidding tractor has a grapple-positioning boom mounted thereon. A cable-operated grapple is releasably coupled to the boom and is placed into log grasping positions by the boom. A cable for closing the tongs of the grapple is connected to a winch mounted on the tractor, which winch is operated to tension the cable and close the grapple. A latch mechanism on the grapple holds the tongs closed and permits the cable tension to be relaxed whereby the grapple may be released from the boom and the tractor may be driven to a more favorable position for skidding the load held by the grapple.

3,781,057
CAMPER TIE DOWN ARRANGEMENT
Larry N. Manuel, 16611 Grand Ave., Bellflower, Calif.
Filed Oct. 28, 1971, Ser. No. 193,532
Int. Cl. B60p 3/32
U.S. Cl. 296—23 MC 13 Claims



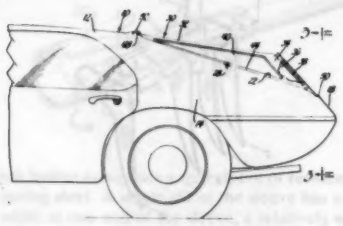
Camper tie downs for securing a camper to the side panels of a pickup truck. Different embodiments of camper tie downs each include a frontwardly projecting nose at the lowermost end of a main arm that angles toward one lateral side of the main arm. Two camper tie downs affixed to each truck side panel are used to anchor the camper against frontward and rearward shifting, tilting, and lifting relative to the bed of the pickup truck. A respective chain attached to the camper is anchored to each tie down by using a head bolt having a tilted head portion that mounts within an anchor hole in the camper tie down nose and is held therein by a threaded nut that engages the underside of the tie down nose.

3,781,058
SHOCK AND VIBRATION DAMPENING MOUNT ASSEMBLY
Walter Ziolko, Willow Springs, and Paul F. Stoeck, Wood Dale, both of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Mar. 3, 1972, Ser. No. 231,568
Int. Cl. B62d 27/04
U.S. Cl. 296—35 R 14 Claims



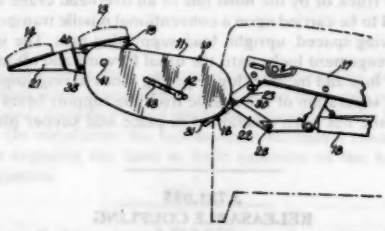
A plurality of elastomer means of varying deflection rates arranged such that vertical shock and dampening is achieved by a first low and a second high deflection rate means, lying in the same parallel plane. Both elastomer means have generally flat top and bottom faces, the second elastomer means being thinner than that of the first and positioned in close proximity thereto.

3,781,059
REMOVABLE VEHICLE BODY CLOSURE WITH DUAL USE INSTALLATION
William A. Davis, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 30, 1972, Ser. No. 257,601
Int. Cl. B60j 7/10
U.S. Cl. 296—137 B 3 Claims



A vehicle body has an opening in the rear deck thereof defined by a flange. A closure panel has a peripheral flange. The flange on the body and the flange on the contoured closure panel are symmetrical with respect to a transverse axis therethrough so that the closure panel may be installed on the body in one use position to close the body opening and provide a coupe style body and installed on the body in a second use position upon 180° rotation about the transverse axis to provide a station wagon style body. A compressible seal located between the flanges provides a weathertight joint.

3,781,060
SAFETY GUARD FOR RECLINING CHAIR AND THE LIKE
Frederick R. Pentzien, Naperville, Ill., assignor to Kroehler Mfg. Co., Naperville, Ill.
Filed Sept. 1, 1972, Ser. No. 285,585
Int. Cl. A47c 3/03
U.S. Cl. 297—68 5 Claims



A safety guard for an exposed linkage of an extendable device utilized in reclining chairs and the like. The safety guard has a body member which fastens on one side of the linkage to restrict access to the space between adjacent links of the linkage in all positions of the linkage.

3,781,061

SAFETY DEVICE FOR A VEHICLE SEAT

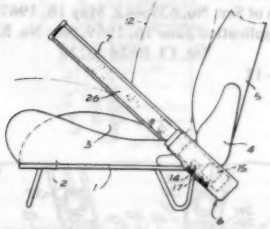
Jurgen Walz, and Eberhard Faust, both of Stuttgart, Germany, assignors to Recaro GmbH & Co., Stuttgart, Germany

Filed Aug. 16, 1972, Ser. No. 281,047

Claims priority, application Germany, Aug. 21, 1971, P 21 42 020.2

Int. Cl. A62b *35/00*; B60r *21/10*

U.S. Cl. 297—388 33 Claims



A safety belt arrangement for a vehicle seat to automatically position the seat belt around the seat occupant as soon as he is seated. One or several driven elongated carriers draw the seat belt into its interlocking position, are released for return to their starting positions as the latch mechanism is closed and are automatically reconnected to the component latch parts when the latch mechanism is unlocked. The operation sequence is activated by a switch in the seat cushion responding to pressure in excess of a given value. Structural details permit mounting the arrangement after car assembly and keep the device and the seat belt straps out of sight when not in use.

3,781,062

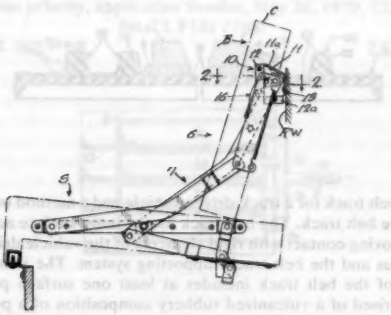
POSITIVE LATCH FOR MOVABLE BACK OF A SEATING DEVICE

David K. Farmer, Niles, and Theodore Dlufosinski, Chicago, both of Ill., assignors to The Seng Company, Chicago, Ill.

Filed July 25, 1972, Ser. No. 274,962

Int. Cl. A47c *1/10, 7/36*

U.S. Cl. 297—379 6 Claims



A positive but readily releasable latch means for retaining the backrest of a seating device in an upright position or releasing it to be swung forward about its lower end. The latch means includes a slotted plate mounted adjacent each end of the backrest, a fixed pin on each end of the backrest impaling the slot and freely movable in and out of it, and a combined latch dog and handle pivoted on each plate which is spring urged to a latching position and is manually movable to a release position in which the spring has moved over center to retain the latch dog in that position. The structure of the latch dog and handle are such that the latch dog can never fail to latch and can never block entry of the latch pins into the slots. The latch is particularly designed for convertible settee-beds of recreational vehicles, which must meet Federal Highway Safety specifications.

3,781,063

MOTOR VEHICLE BRAKING CIRCUITS

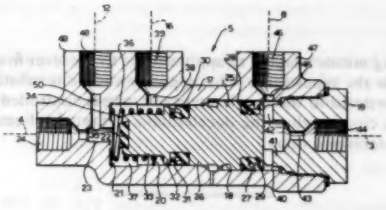
Luigi Valpreda, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Apr. 19, 1972, Ser. No. 245,454

Claims priority, application Italy, Apr. 28, 1971, 68412 A/71

Int. Cl. B60t *13/00*

U.S. Cl. 303—6 C 6 Claims



A control device for motor vehicle hydraulic braking circuits of the type having separate circuits for the front wheel brakes and the rear wheel brakes and a pressure reducer for reducing the braking pressure applied to the rear wheel brakes in relation to the pressure applied to the front wheel brakes. The control device operates to short circuit or bypass the pressure reducer in the event of a loss of braking pressure in the front wheel braking circuit so that the maximum braking effect can be obtained from the rear wheels under these conditions. The device includes a piston and a valve controlling a bypass route which short circuits the pressure reducer, the piston is formed in two parts of different diameters and slides in a cylinder formed in two parts of correspondingly different diameters; hydraulic braking pressure is applied to one side of the piston from the front wheel braking circuit and to the other side of the piston from the rear wheel braking circuit so that the valve controlling the bypass route is closed under normal braking conditions, but opened if the pressure on the side of the piston supplied from the front wheel braking circuit should fall below its normal value. A spring biases the piston away from its operating position so that it is moved on enemy braking operation to ensure that it does not become inoperative due to a long period out of use.

3,781,064

BRAKE CONTROL APPARATUS

Philip Augustus Taft, Solihull, England, assignor to Girling Limited, South Yardley, Birmingham, England

Filed Aug. 6, 1971, Ser. No. 169,697

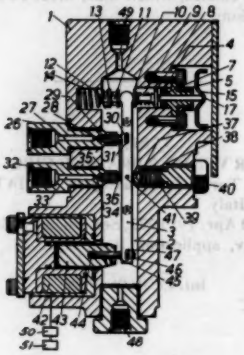
Claims priority, application Great Britain, Aug. 14, 1970, 39,209/70

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F 7 Claims

Brake control apparatus for use in a braking system in which an input force from an input member is applied to brake

applying means through a lever in the control apparatus, the lever controlling valves in a brake fluid circuit. A substantial proportion of the input force is absorbed by a spring and only the remaining portion of the input force acts on the lever to actuate the brakes. The apparatus includes deceleration



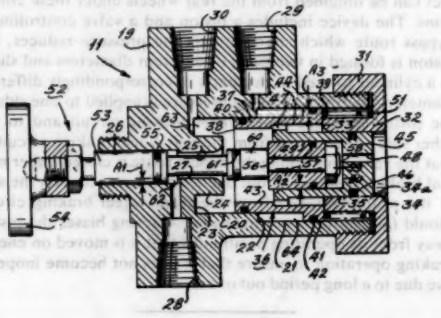
sensing means adapted to apply a force to the lever in opposition to the input force. The opposition force is substantially proportional to the deceleration of a wheel controlled by the brake circuit, when the deceleration of the wheel exceeds a predetermined value.

3,781,065

CONTROL VALVE

Raymond J. Kersting, Dellwood, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Feb. 11, 1972, Ser. No. 225,470
Int. Cl. B60t *15/16*
U.S. Cl. 303—71 **7 Claims**



A control valve for use in a brake system having dual fluid pressure sources and a spring setting pressure released brake actuator is provided with selectively operable means for applying to said actuator fluid pressure supplied from one of said sources and for venting the applied fluid pressure to atmosphere to effect spring setting actuation of said actuator, and resiliently urged means is provided for also venting the applied fluid pressure to atmosphere independently of said selectively operable means when the fluid pressure of the other of said sources acting on said resiliently urged means is less than a predetermined value.

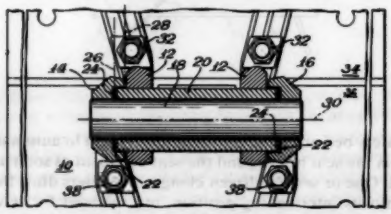
This invention relates generally to control valves and in particular to push-pull type control valves for use in a fluid pressure system to control a spring setting pressure released brake actuator thereof.

3,781,066

TRACK PIN AND BUSHING SEAL ASSEMBLY

Jack M. Deli, Wheaton, and Ramiz Y. Hermiz, Addison, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 639,442, May 18, 1967, abandoned.
This application June 16, 1969, Ser. No. 835,298
Int. Cl. B62d *55/20*
U.S. Cl. 305—11 **10 Claims**



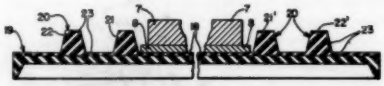
Track pin and bushing seal assembly of two Belleville spring washers separated by a flat metal washer.

3,781,067

BELT TRACK STRUCTURE

Merritt E. Dodson; Richard L. Marsh, both of Lincoln, and Frank C. Masters, Palmyra, all of Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 21, 1972, Ser. No. 290,935
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB **20 Claims**



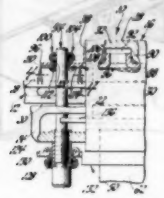
A belt track for a track-driven vehicle and a method of making the belt track. The belt track has an inner surface adapted for moving contact with rigid elements of the vehicle drive apparatus and the belt track supporting system. The inner surface of the belt track includes at least one surface portion comprised of a vulcanized rubbery composition of a polybutadiene polymer. Other different rubbery polymers such as styrene/butadiene or nitrile rubber may also be used in combination with the polybutadiene polymer. The surface portions provide a low friction, wear resistant surface which is resistant to temperature extremes. The belt track is particularly useful in conjunction with vehicle slider suspension systems and with driving systems in which a driving sprocket comes into moving contact with driving teeth or lugs formed on the inner surface of the belt track.

3,781,068

BUSHING ASSEMBLY

Frank W. Brooks, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 10, 1972, Ser. No. 279,485
Int. Cl. F16c 17/00
U.S. Cl. 308—4 R 3 Claims



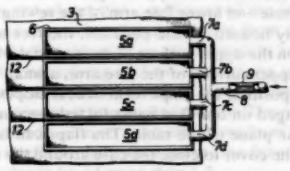
A bushing assembly installed in a sliding caliper, axially fixed rotatable disc, brake assembly in which the brake shoes transmit the brake torque to the caliper frame, which in turn transmits the brake torque to a fixed support member. The caliper assembly has a brake pad assembly including a brake shoe with ends extending laterally beyond the caliper frame and provided with a guide and support bushing assembly at each end, and a mounting plate operatively secured to the caliper frame. The mounting plate has laterally extending ends which each have a guide and support bushing assembly aligned with a similar arrangement in the noted brake shoe. Guide and support pins are fixed to the fixed support member and have portions extending through the bushing in the mounting plate and brake shoe ends so that the caliper is slidably supported and guided. Each bushing assembly includes an annular retainer having one end formed as an inwardly opening semi-torus and holding an elastomeric bushing engaging the associated pin in sliding relation, and the other end formed to lock the retainer in an aperture formed in the shoe or mounting plate end to which it is secured.

3,781,069

HYDROSTATIC BEARING

Gerszon Gluchowicz, Ddjursholm, Sweden, assignor to AB UVA, Bromma, Sweden

Filed May 24, 1971, Ser. No. 146,103
Claims priority, application Sweden, May 26, 1970, 7226/70
Int. Cl. F16c 17/00
U.S. Cl. 308—5 R 2 Claims



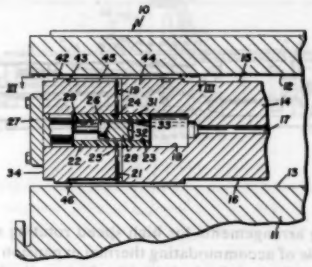
A hydrostatic bearing in which one of the opposed bearing members has a plurality of part-pockets in it into all of which the hydrostatic fluid is pumped and each of which is surrounded by a ridge. When an impact load is applied to the bearing, the hydrostatic fluid flows out through the gaps between the ridges of the one bearing member and the opposed bearing member into drainage grooves provided in the one bearing member which are disposed between adjacent ridges, and is recirculated.

3,781,070

MACHINE TOOL

Herbert R. Uhtenwoldt, Worcester; Richard E. Crossman, Leominster, and Charles T. Caliri, Worcester, all of Mass., assignors to Cincinnati Milacro-Heald Corp., Worcester, Mass.

Filed May 18, 1972, Ser. No. 254,500
Int. Cl. F16c 17/16
U.S. Cl. 308—5 R 6 Claims



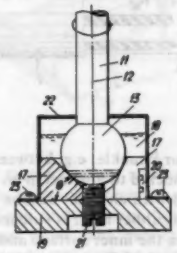
A machine tool in which a moveable table is mounted in opposed hydrostatic bearings which have means for regulating the flow to the bearings to maintain a stable position of the table despite changes in load.

3,781,071

ELASTOHYDRODYNAMIC BEARING ASSEMBLY

James Joseph Kauzlarich, Charlottesville, Va., assignor to Research Corporation, New York, N.Y.

Filed May 17, 1971, Ser. No. 143,943
Int. Cl. F16c 7/04, 17/06
U.S. Cl. 308—9 8 Claims



The invention discloses an elastohydrodynamic bearing assembly, with many configurations the simplest of which has a load supporting rotary shaft with a part-spherical tip supported in a pyramidal seat. An elastohydrodynamically compatible lubricant provides a thin film between the bearing surfaces. The seat provides multipoint self-aligning support and is elastically deformable; this, in conjunction with an increase in lubricant viscosity due to high operational pressures, enables the development of a satisfactory lubricant film in accordance with elastohydrodynamic lubrication theory.

3,781,072

BEARING ARRANGEMENT

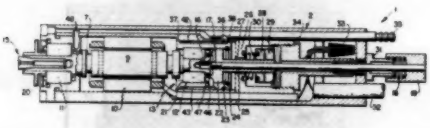
Fritz Nattefort, Leichlingen, Germany, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1972, Ser. No. 231,108

Claims priority, application Germany, Mar. 5, 1971, P 21 10 663.8

Int. Cl. F16c 35/12

U.S. Cl. 308—15 16 Claims



Bearing arrangements for high speed rotating shafts which are capable of accommodating thermal expansion and thereby minimizing changes in the initial loading on the bearings and which are constructed so that the initial loading can be adjusted to a selected magnitude.

3,781,073

BEARING

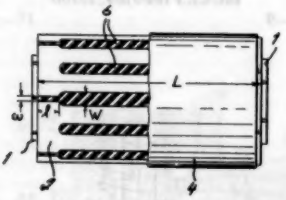
Raoul Jorn, Hengnau, and Peter Reichardt, Fellbach, both of Germany, assignors to Raoul Jorn, Hengau, Post Wasserburgh A.B., Germany

Filed Feb. 22, 1972, Ser. No. 228,153

Claims priority, application Germany, Feb. 20, 1971, P 21 08 154.9; Sept. 6, 1971, P 21 44 507.8

Int. Cl. F16c 33/04

U.S. Cl. 308—238 60 Claims



A bearing, joint or knuckle, e.g. between a steering rod and a lever or arm connected to a wheel in an automotive steering linkage, is provided with an inner and/or an outer metal shell or sleeve to which a rubber layer is vulcanized, the force being transmitted between the inner surface and the outer surface of the joint through elastic deformation of the elastomeric layer. One or both of the shells is, according to the invention, slotted parallel to generatrices of the shell.

3,781,074

SLIDE TOP DESK

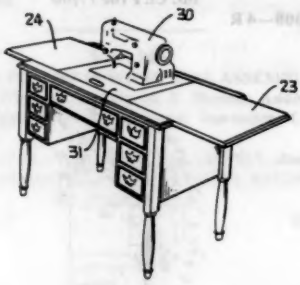
Robert Arthur Trueblood, Paoli, Ind., assignor to Cornwell Company, Inc., Paoli, Ind.

Filed Apr. 21, 1972, Ser. No. 246,411

Int. Cl. A47b 81/00

U.S. Cl. 312—30 12 Claims

A desk suitable for housing a sewing machine is disclosed. The top of the desk has two sliding portions which can slide apart to allow a third hinged center section to be swung up into place between the two sliding portions. A sewing machine



may be mounted on the center section and can be hidden from sight when the center section is lowered.

3,781,075

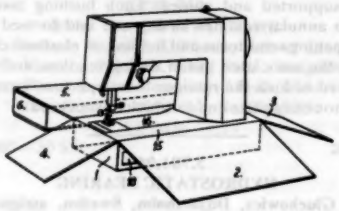
SEWING MACHINE CASE

Marcel Fresard, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Oct. 19, 1971, Ser. No. 190,625

Int. Cl. A47b 21/00, 95/02

U.S. Cl. 312—208 3 Claims



A sewing machine case comprises a rectangular box-like hollow pedestal to the upper edges of which are hinged four flaps. A base and lower free arm of the sewing machine can be removably housed in said pedestal, the free arm fitting in an opening in the upper surface of the pedestal which forms, with the flat upper surface of the free arm, a small work table. In a lowered position the flaps form access slopes to this table, a cover hinged on one flap being folded thereunder to hold the flap in the plane of the table. The flaps can be folded up and fixed to the cover to close the case around the machine.

3,781,076

CATHODE RAY TUBE RECLAMATION PROCESS

Leonard Dietch, Skokie, and Martin L. Lerner, River Forest, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

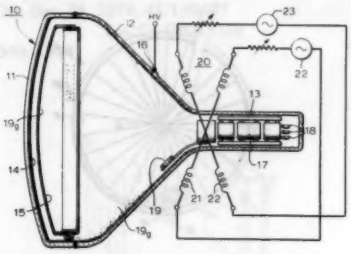
Filed Dec. 6, 1971, Ser. No. 205,180

Int. Cl. H01j 9/50

U.S. Cl. 316—2 2 Claims

A method of neutralizing an undesired constituent trapped within a cathode ray tube which includes a gas absorber con-

templates irradiating the constituent with a source of electromagnetic energy for a period of time sufficient to reduce the constituent to its gaseous reaction products and then effecting absorption of the gaseous products by pumping action of the gas absorber.



3,781,077

HEAT-REFLECTING WINDOW PANE

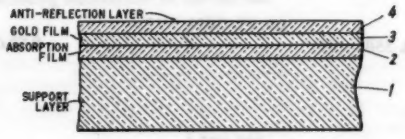
Rolf Groth, Mullensiefenring 8, 5810 Witten, Germany

Filed June 8, 1971, Ser. No. 151,035

Claims priority, application Germany, June 13, 1970, P 20 29 181.0

Int. Cl. G02b *5/26*

U.S. Cl. 350—1 **12 Claims**



A heat-reflecting window pane which has a transmissivity of 20 to 60 percent for visible light comprises a transparent support layer provided with a heat-reflecting gold film and when installed presents the support layer to the exterior. An absorption layer is disposed between the transparent support layer and the gold film, such absorption layer being of a material and thickness such that the light transmissivity of the combined support and absorption layers is 10 to 65 percent less than that of the support layer alone. The support layer has a refractive index and absorption coefficient of the same order of magnitude and may comprise an element from the fourth period of the periodic table with an atomic weight between 20 and 28 or an alloy containing such an element. An anti-reflective layer is disposed on the other side of the gold film and may be covered by a transparent protective layer. The anti-reflective layer, e.g., made of zinc sulphide, is made of dielectric material which is substantially absorption-free for visible light and has a refractive index of more than 1.7.

3,781,078

OPTICAL SCANNER WITH LASER

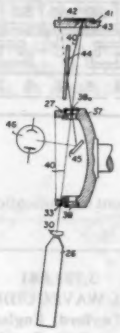
Ernest Wildhaber, 124 Summit Dr., Brighton, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,622

Int. Cl. G01n *21/30*; **G02b** *17/00*; **H04n** *3/00*

U.S. Cl. 350—6 **9 Claims**

In this optical scanner the light source is a laser emitting light through lenses of a rotor to a record. The laser unit emits light through a stationary line-like area. As the laser beam is of limited angular sweep the invention provides a refractory part rigid with the rotor and of varying thickness to deflect said beam, causing it to follow the lens of the turning rotor that projects said beam to the record. The refractory part may be in the form of a ring of an average radius approximately equal to the distance of said lenses from the rotor axis. Or it may be in the form of sectors alternating with said lenses.



3,781,079

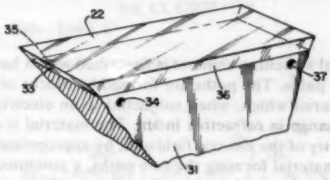
ALIGNED SCANNING MIRROR

Hans A. Hug, Weston, and Paul W. Jone, Franklin, both of Mass., assignors to Identicon Corporation, Waltham, Mass.

Division of Ser. No. 89,250, Nov. 13, 1970, Pat. No. 3,657,792. This application Feb. 4, 1972, Ser. No. 223,740

Int. Cl. G02b *17/00*

U.S. Cl. 350—7 **1 Claim**



In a multifaceted mirror scanner, a mirror attached to a carrier that is precisely positioned receives energy from a collimated beam of light and reflects this energy toward a predetermined target point. The carrier is then deformed, such as by making a dimple near an edge where the mirror should be raised slightly, to deflect the beam so that the reflected image is precisely oriented on the target point.

3,781,080

LIQUID CRYSTAL DEVICE FOR GENERATING RETICLES IN OPTICAL EQUIPMENT

Siegfried Aftergut, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

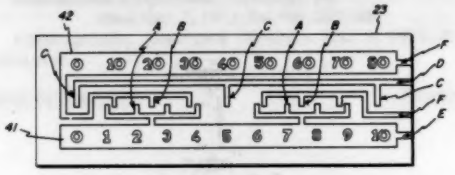
Filed Nov. 30, 1972, Ser. No. 310,861

Int. Cl. G02f *1/16*

U.S. Cl. 350—10 **7 Claims**

Liquid crystal devices for generating reticles in optical in-

struments are described. The reticles include liquid crystal display devices having electrically selectable calibration scales



corresponding to different magnification powers of the optical instrument.

3,781,081

ELECTRO-OPTICAL WAVEGUIDE ARRANGEMENTS

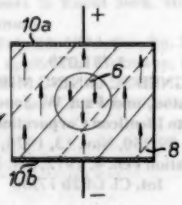
George H. S. Rokos, Twyford, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Apr. 17, 1972, Ser. No. 244,619

Claims priority, application Great Britain, Apr. 17, 1971, 9,757/71

Int. Cl. G02b 5/14; G02f 1/26

U.S. Cl. 350—96 WG **9 Claims**



An optical switching element is described which has at least two optical paths. The paths are formed by blocks of electro-optical material which, when subjected to an electrical field, suffers a change in refractive index. The material is sensitive to the polarity of the electric field and, by appropriately orientating the material forming the two paths, a common electric field applied across both paths will produce a change in refractive index in opposite senses in the two paths. This enables light transfer between the two paths to be controlled. Also described are logic elements formed by coupling two or more such switching elements.

3,781,082

REFLECTOR MOUNT FOR SPOKED WHEEL

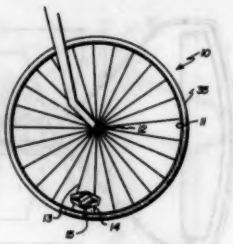
Henry Linder, Wood Dale, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Continuation-in-part of Ser. No. 254,950, May 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 228,178, Feb. 22, 1972. This application July 31, 1972, Ser. No. 276,452

Int. Cl. G02b 5/12

U.S. Cl. 350—99 **10 Claims**

Side reflectors mountable between adjacent spokes of a bicycle wheel, each reflector having an obverse side with a reflector element and a reverse side with frictional locking tabs formed at opposite ends. Closely dimensioned locking spaces are between the tabs and the reverse side of the plate so that adjacent bicycle spokes may be captured within the spaces. The adjacent spokes urge portions of the locking tabs away from the reverse side of the plate, and thereby assume frictional locking engagement with the reflector.



3,781,083

LIGHT REFLECTING SYSTEM

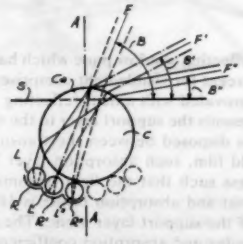
Ludwig Eigenmann, Vacallo, Canton Ticino, Switzerland

Filed July 10, 1972, Ser. No. 270,572

Claims priority, application Italy, Sept. 10, 1971, 26899 A/71

Int. Cl. G02b 5/12

U.S. Cl. 350—105 **8 Claims**



The disclosure describes an optical system adapted for providing road signs and markers and the like, and capable of reflecting incident light in essentially the same direction as that of incidence, regardless of the angle of incidence. The system comprises a primary surface layer of transparent spheres positioned to be impinged by light beams and capable of primarily focusing the light impinging thereon, a secondary lower layer comprising minor transparent spheres individually arranged for secondarily focusing of the light issued by the first spheres and located at different distances from the respective adjacent first sphere, and a sheet of reflective material having embossed concavities individually positioned adjacent to each minor sphere for reflecting the secondarily focused light, the spheres being at least partially embedded in a transparent bonding layer the index of refraction of which is lower than that of the spheres.

3,781,084

REVERSIBLE PHASE MODULATING ELEMENT

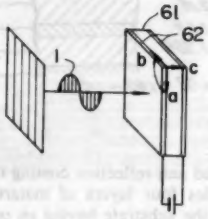
Akira Fukuhara, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 9, 1971, Ser. No. 206,391

Claims priority, application Japan, Dec. 9, 1970, 45/108530; Dec. 25, 1970, 45/130687

Int. Cl. G02f 1/26

U.S. Cl. 350—150 9 Claims



A pattern generating device includes a plurality of biaxial birefringent irregular ferroelectric crystal elements, each crystal being cut such that mutually opposing planes are normal to any of the *a*-, *b*- and *c*-axis that a thickness between the planes is that of a half-wave plate, said crystal elements being arranged in the form of a matrix on an identical plane normal to incident light, a required information pattern being recorded on a photosensitive medium in a manner that elements corresponding to the information pattern are manipulated by a threshold voltage applied to the Z-planes of the respective elements so that a large-capacity information recording method can be carried out.

3,781,085

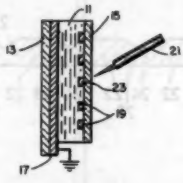
LIQUID CRYSTAL DISPLAY

Marshall Leibowitz, Englewood, N.J., assignor to Ing. C. Olivetti & C., S.p.A., Invrea, Italy

Filed May 10, 1972, Ser. No. 251,993

Int. Cl. G02f 1/16

U.S. Cl. 350—150 6 Claims



A liquid crystal display in which a layer of liquid crystal material is confined between a pair of spaced parallel substrates. A common electrode is deposited on one of the substrates, and a plurality of independent conductive spots are deposited on the interior face of the other of the substrates opposite to the common electrode. Electrical field producing means are provided for inducing a voltage in a selected conductive spot in order to excite the liquid crystal material between the selected conductive spot and the common electrode.

3,781,086

DOMAIN SWITCHING ELEMENT AND METHOD OF PRODUCING THE SAME

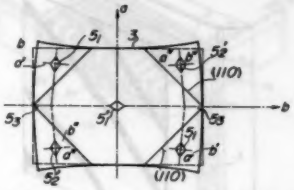
Akio Kumada; Yoshihiro Onishi, both of Kokubunji; Hirohumi Ogawa, Hichioji; Sakichi Ashida, Fuchu, and Saburo Nonogaki, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 27, 1972, Ser. No. 266,658

Claims priority, application Japan, June 30, 1971, 46-47217; June 30, 1971, 46-48330; Sept. 18, 1971, 46-72679; Sept. 18, 1971, 46-72680; July 28, 1971, 46-56539

Int. Cl. G02f 1/26

U.S. Cl. 350—150 4 Claims



A domain switching element using a plate of an irregular ferroelectric crystal cut perpendicularly to the ferroelectric axis of the crystal and having nucleus domains of multiple domain structure provided on both the sides of the switching region of the element in the direction <110> of the crystal, the nucleus domains extending along the direction <110>. The area of single domain having a predetermined polarity can be arbitrarily controlled in response to the polarity of the threshold voltage applied to the switching region.

3,781,087

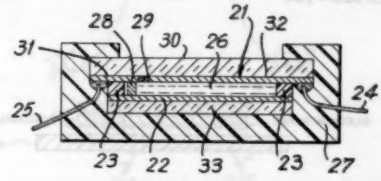
MOLDING CONSTRUCTION OF PLATES OF LIQUID CRYSTAL DISPLAY

Jin Nagasaki, Shimosuwa-Machi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 50,603, June 29, 1970, abandoned. This application May 8, 1972, Ser. No. 251,050

Int. Cl. G02f 1/34

U.S. Cl. 350—160 LC 5 Claims



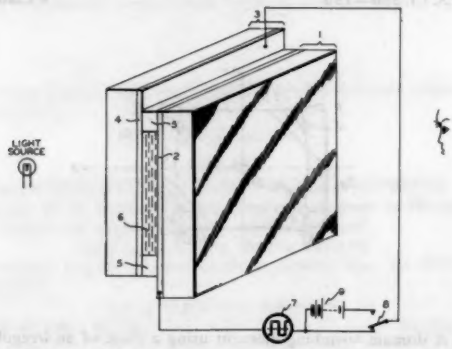
A method of preparing a liquid crystal device is disclosed in which two plates, at least one of which is transparent, are molded in situ within an encasement having a window therethrough through which said liquid crystal device can be viewed. The plates are spaced apart, forming, in combination with an insulating spacer, a chamber containing liquid crystal material. The molding operation seals the chamber against the entry of oxygen and moisture. The resultant device is stable because well sealed.

3,781,088

METHOD FOR CHANGING THE TRANSPARENCY OF A LIQUID CRYSTAL CELL

Masahide Tsukamoto, Katano-shi, and Tetsuro Ohtsuka, Takatsuki-shi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed July 27, 1972, Ser. No. 275,744
Claims priority, application Japan, July 29, 1971, 46-57365
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 12 Claims



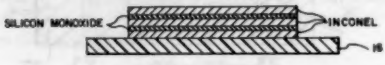
A liquid crystal cell including a liquid crystal mixture comprising a nematic liquid crystal having a positive dielectric anisotropy and a stersidal compound which becomes light-transparent from an opaque state when the liquid crystal cell is subjected to an exciting electric field beyond a threshold value of the liquid crystal mixture. The decay time of the liquid crystal mixture required for the liquid crystal mixture to return from the light-transparent state to the opaque state after removal of the exciting voltage beyond the threshold value is increased by applying an a.c. bias voltage below the threshold value.

3,781,089

NEUTRAL DENSITY FILTER ELEMENT WITH REDUCED SURFACE REFLECTION

Robert J. Fay, and John R. Cicotta, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,326
Int. Cl. G02b 5/28; B32b 15/04
U.S. Cl. 350—164 4 Claims



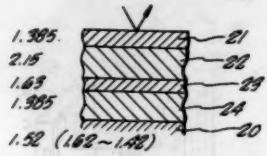
A neutral density filter element for use with photographic apparatus is formed by depositing alternate layers of a metal or metal alloy and a dielectric on a transparent substrate, to a predetermined optical density or reflectivity respectively. The initial and final layers are of the metal or metal alloy. The dielectric layer has a lower index of refraction than the metal or metal alloy layer. In the preferred embodiment Inconel is used as the metal alloy layer and silicon monoxide as the dielectric layer.

3,781,090

FOUR LAYER ANTI-REFLECTION COATING

Haruki Sumita, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Minami, Osaka, Japan

Filed Nov. 6, 1972, Ser. No. 304,140
Int. Cl. G02b 1/10
U.S. Cl. 350—164 20 Claims



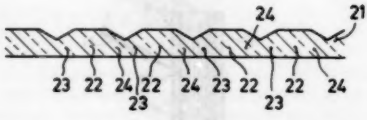
A multi-layered anti-reflection coating for use with a glass substrate includes four layers of material, the first layer furtherest from the substrate having an optical thickness of a preselected design wavelength, λ_o, in the range of $0.260\ \lambda_o > N_1 d_1 > 0.230\ \lambda_o$ and an index of refraction in the range of 1.35 to 1.62. The second layer having an optical thickness in the range of $0.520\ \lambda_o > N_2 d_2 > 0.400\ \lambda_o$ and an index of refraction in the range of 2.00 to 2.30. The optical thickness of one of the third and fourth layers is in the range of $0.500\ \lambda_o > Nd > 0.250\ \lambda_o$ while the optical thickness of the other layer of the third and fourth layers is in the range of $0.250\ \lambda_o > Nd > 0.060\ \lambda_o$. The third layer has an index of refraction in the range of 1.56 to 1.72 and the fourth layer closest to the substrate has an index of refraction in the range of 1.35 to 1.62. The optical thicknesses of the layers can be varied to compensate for any variations from the theoretical design index of refractions.

3,781,091

ARRANGEMENT FOR RENDERING THE STRUCTURE OF AN OPTICAL IMAGE SUBSTANTIALLY INVISIBLE

Eric Tapley Ferguson, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed July 12, 1972, Ser. No. 271,057
Claims priority, application Netherlands, July 17, 1971, 7109911
Int. Cl. G02b 5/00
U.S. Cl. 350—167 4 Claims



A device by which the structure of an optical image can be rendered substantially invisible. The optical image is made up of a plurality of light-emitting or light-deflecting elements, for example luminescent stripes of a colour television display screen, scanning lines of a television image or elements of a display panel. The arrangement comprises a light-transmitting plate which contains portions of alternately linearly varying the thicknesses. This enables the modulation transfer function for the spatial frequency $1/a\ m^{-1}$ to be made substantially zero and for the spatial frequency $1/2a\ m^{-1}$ to be made a maximum.

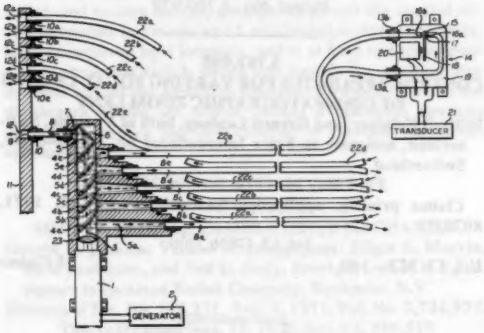
3,781,092

MONITORING SYSTEM

David L. Sussman, RD No. 2, Amhurst, Mass., and Arthur Sussman, 40 Lexington Ave., New York, N.Y.

Filed June 28, 1971, Ser. No. 157,567

U.S. Cl. 350—266 12 Claims



A light circuit which is the combination of a laser light source, optical fiber light paths, or more transducers, shutters or other light modulating means and appropriate readout device means which is preferably one which reads out directly in light terms. The transducer imparts information, suitable medical information to the modulator which in turn varies the laser light beam in the optical fiber path. The varied light beam is read directly without any energy converison being necessary.

3,781,093

ADJUSTABLE MIRROR STAND

Sophie Mary Grabijas, 14037 Crosley, Detroit, Mich.

Filed Oct. 18, 1971, Ser. No. 190,096

Int. Cl. G02b 5/08

U.S. Cl. 350—288 3 Claims

An adjustable mirror stand assembly such as may be used to assist in the application of make-up, has a pair of spaced apart pivoting units to allow substantially one hundred eighty degree spherical positioning at any angular relationship to a supporting surface. An adjustable length shaft further provides height variations of the mirror above the supporting surface.

3,781,094

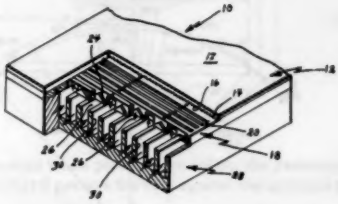
LIQUID COOLED MIRROR STRUCTURE

Raymond H. Griest, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 15, 1972, Ser. No. 289,692

Int. Cl. G02b 5/08

U.S. Cl. 350—310 18 Claims



A liquid cooled mirror structure having a body, inner plate and face sheet. The body has longitudinal channels therein, the inner plate has narrow channels therein perpendicular to the longitudinal channels and the face sheet has a dense pattern of grooves therein perpendicular to the narrow channels. In operation coolant flows horizontally through the longitudinal channels, vertically through the narrow channels and horizontally through the grooves thereby cooling the face sheet by providing a high intrinsic impedance to the coolant flow, and high specific heat transfer coefficient, with a minimum of pressure drop.

3,781,095

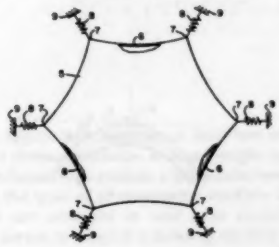
REFLECTOR

Frank C. Rushing, Ellicott City, Md., and Lynford W. Gilbert, Palos Verdes Peninsula, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1969, Ser. No. 883,017

Int. Cl. G02b 7/18

U.S. Cl. 350—310 3 Claims

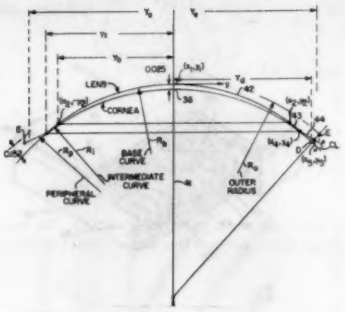


Described is an improvement in a thin membranous reflector having a continuous array of inwardly bending support cable means around its perimeter for stretched-flat tension-spring support at discrete outwardly extending apex locations of such array. The improvement resides in imparting a creep characteristic to such cable means which matches that of the reflector membrane while subjected to the flatness-inducing tensioning thereof, in behalf of assuring preservation of a stretched-flat state of such membrane for a prolonged period of time.

3,781,096
METHOD AND APPARATUS FOR DESIGNING CONTACT LENSES

Malcolm G. Townsley, Park Ridge, Ill., assignor to Wesley-Jessen, Inc., Chicago, Ill.

Filed Nov. 1, 1972, Ser. No. 302,777
Int. Cl. A61b *3/10, 3/14;* **G01b** *11/24*
U.S. Cl. 351—13 **10 Claims**

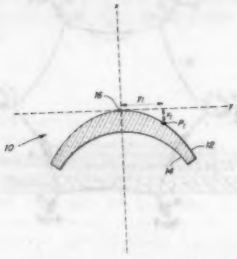


A method and apparatus for the design of contact lenses is disclosed wherein the contour of a patient's cornea is measured to generate a curve representing the contour of the cornea. With the desired bearing diameter of the contact lens and the apical clearance known along with the generated ellipse which represents the cornea contour, the base curve of the contact lens is computed which curve describes the interior surface of the optical zone of the contact lens. The intermediate, or bearing curve is then computed to parallel the curvature of the cornea such that the intermediate curve bears against the surface of the cornea, and finally the peripheral curve is computed based on the edge clearance and thickness desired. The design of the contact lens is completed by computing the front curve of the lens based on the prescription.

3,781,097
ASPHERIC LENS SURFACE

Edwin W. Bechtold, Manhasset, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed May 15, 1972, Ser. No. 253,011
Int. Cl. G02c *7/02*
U.S. Cl. 351—167 **6 Claims**



An aspheric ophthalmic lens series for use in the correction of aphakia. The series includes lenses having vertex powers extending from about +7.75 diopters to about +18 diopters and each of the lenses included within the series are provided with a front surface having an aspheric cross-sectional curvature defined by the equation

$$x = a/(by^2 + 1) + cy^3 + dy^4 - a$$

The lens series is designed to provide improved visual acuity to the aphakic patient throughout his normal range of vision while, at the same time, afford the fitter with substantial latitude in lens selection. The aspherically curved surfaces according to the present invention are also particulary well-suited for use in a series of multifocal lenses.

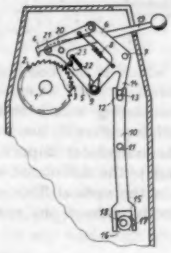
ERRATUM

For Class 351—16 see:
Patent No. 3,780,979

3,781,098
CONTROL APPARATUS FOR VARYING FOCAL LENGTH OF CINEMATOGRAPHIC ZOOM LENS

Wilfred Heiniger, and Gerard Lepinay, both of Yverdon, Switzerland, assignors to Bolex International SA, Sainte-Croix, Switzerland

Filed May 26, 1972, Ser. No. 257,075
Claims priority, application Switzerland, June 2, 1971, 8078/71
Int. Cl. G03b *3/00*
U.S. Cl. 352—140 **5 Claims**

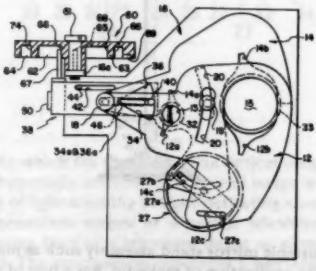


A cinematographic apparatus provided with a zoom lens comprising focal length varying means for varying the focal length of the lens during film standstill periods and for fixing the same during obturation periods.

3,781,099
AUTOMATIC OR PRESETTABLE DIAPHRAGM APPARATUS

Francis A. Williams, Webster, and Harvey H. Dudley, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,621
Int. Cl. G03b *7/10, 9/07, 19/18*
U.S. Cl. 352—141 **3 Claims**



Diaphragm apparatus for use in a camera for alternatively providing either a continuous variable setting of an exposure aperture to sizes related to received light intensity or a preselectable, fixed exposure aperture size. The apparatus in-

cludes diaphragm blades coupled to a self-balancing, light responsive control circuit for establishing the size of the exposure aperture as a function of received light intensity, and switch means which when actuated disable the self-balancing circuit and configures the control circuit to drive the diphragm blades in a direction to form a minimum exposure aperture size. A mode selecting control emement, coupled with a diaphragm stop member, in a first position controls the switch and locates the stop member to permit the control circuit to operate in a mode which establishes an aperture size related to received light intensity, and in at least one other position controls the switch means and locates the aperture stop member so that the apparatus operates in a mode in which the diaphragm blades are driven toward a minimum aperture setting but engage the stop member to establish the preset aperture size.

3,781,100

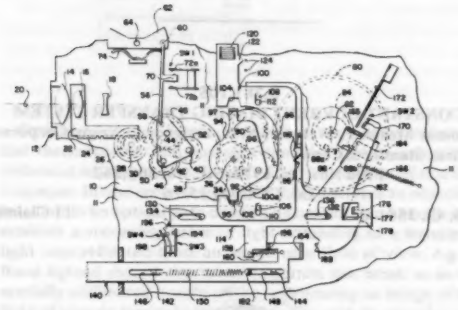
MOTION PICTURE CAMERA DRIVE MECHANISM

Gerald L. Jenkins; Vernon H. Jungjohann; Edgar S. Marvin, all of Rochester, and Neil G. Seely, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 168,221, Aug. 2, 1971, Pat. No. 3,724,937. This application Sept. 15, 1972, Ser. No. 289,517

Int. Cl. G03b *21/48*

U.S. Cl. 352—180 **3 Claims**



A motion picture camera drive mechanism includes a single motor which is used for driving (separately or simultaneously) a film pull down mechanism which advances film past an exposure aperture and a mechanism for adjusting at least one lens element in a zoom lens system. When the camera drive mechanism is to be energized, provision is made for first energizing a circuit to an automatic exposure control system and then operating the film pull down mechanism, thereby effecting correct exposure of the first frame of film.

3,781,101

CINEMATOGRAPHIC CAMERA

Keiji Kaneko, Kanagawa, and Toshio Yoshida, Saitama, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

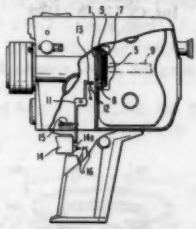
Filed June 30, 1972, Ser. No. 267,756

Claims priority, application Japan, June 30, 1971, 46/48264

Int. Cl. G03b *1/48*

U.S. Cl. 352—221 **13 Claims**

A motion picture camera with a film gate comprising an aperture plate and a pressure plate. The pressure plate holds the film in the camera against the aperture plate only when motion pictures are being taken. The camera includes apparatus for moving the pressure plate to a position where the film is not pressed against the aperture plate when pictures are not being taken. Upon the operation of a part of the camera



normally operated when pictures are taken, the pressure plate is released so that it presses the film against the aperture plate.

3,781,102

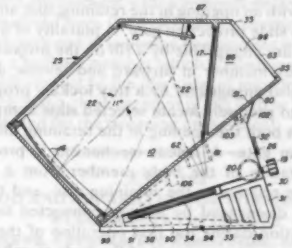
MODULAR STRUCTURE FOR VIEWING APPARATUS

Jasper S. Chandler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 19, 1971, Ser. No. 126,216

Int. Cl. G03b *23/12, 21/22*

U.S. Cl. 353—26 **12 Claims**



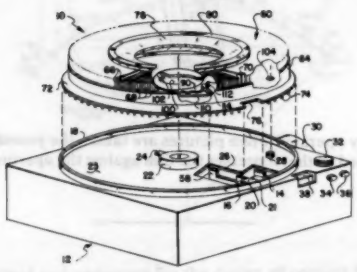
A viewing apparatus comprises at least two or, in some instances, three distinct modules. A base module includes a light source, a condenser lens system, a projection lens system, and a carrier for the type of photographic medium to be viewed, all of which are arranged in said base module. The base module also serves to support a housing module in which one or more mirrors are arranged for directing the projected image onto a front surface screen that is also mounted within the housing module. Filter means is arranged between the screen and a viewing opening in the housing module for compensating for the color temperature of the light source, thereby optimizing the luminance of the projected image reflected by the screen when viewed through the opening by an observer. The filter means also serves to reduce ambient light and is mounted in such a way as to seal the housing module against the entry of dust and dirt from the environs. In addition, the filter means provides a level of light (image luminance) that is suitable and comfortable for extended periods of viewing.

3,781,103

SLIDE TRAY

Matthew DiPietro, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,763
Int. Cl. G03b *23/06*
U.S. Cl. 353—111 **1 Claim**



A slide tray and projector in which the tray has a circular compartmented body member for receiving slides and a slide retaining member or disc carried by and rotatable relative to the body member. When the slide tray is mounted on a projector, the slide retaining disc is held in a fixed position relative to the projector with an opening in the retaining disc aligned with the projector's slide projection gate. A plurality of pins on the body member are engageable by a rib on the projector for indexing the body member in forward and reverse directions. The pins are also engageable by a tray locking projection on the projector to precisely locate selected slide compartments in registry with both the opening in the retaining disc and the slide projection gate. A detent mechanism is provided for preventing rotation of the body member from a predetermined position relative to the retaining disc, and the detent mechanism is disengaged by a lever connected to the tray locking projection during the first operation of the indexing mechanism to permit movement of the body member relative to the retaining disc. In any other position of the body member relative to the retaining disc, the detent mechanism is ineffective to prevent rotation between the body member and the disc.

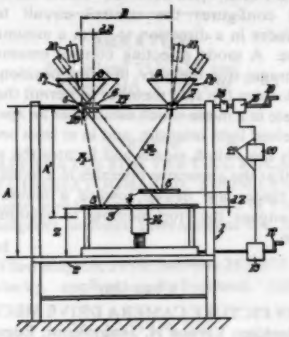
3,781,104

STEREOSCOPIC PLOTTING APPARATUS

Bernard Louis Yves Dubuisson, Paris, France, assignor to Societe Francaise D'Optique Et De Mecanique S. F. O. M., Rueil-Malmaison, France, part interest to each

Filed May 21, 1969, Ser. No. 826,618
Claims priority, application France, May 22, 1968, 68152653
Int. Cl. G03b *37/32, 35/14*
U.S. Cl. 355—22 **4 Claims**

The apparatus comprises a table displaceable vertically by a manual control, and two projectors each projecting a photograph. The vertical displacement of the table causes, by a synchrotransmitter, a synchro-receiver and a threaded shaft, a



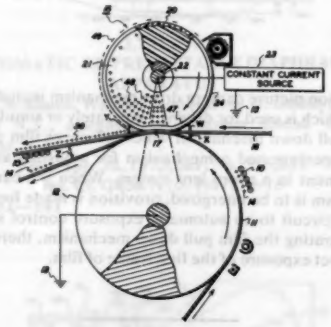
proportional horizontal displacement of one of the projectors towards or away from the other projector. This apparatus brings out the relief, even if it is not very pronounced.

3,781,105

CONSTANT CURRENT BIASING TRANSFER SYSTEM

Thomas Meagher, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1972, Ser. No. 309,562
Int. Cl. G03g *15/16*
U.S. Cl. 355—3 **11 Claims**



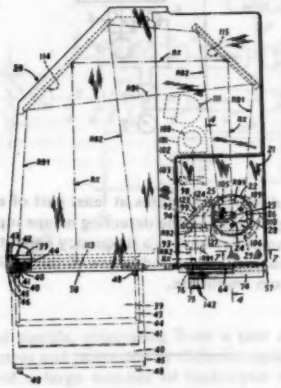
Electrostatic transfer of charged particles to a transfer member is accomplished using a roller electrode having electrically relaxable and self-leveling layers. The roller, along with the original support for the particles, defines a nip through which the transfer member is passed. Asymmetrical fields associated with the roller permit desirable post-nip air ionization while suppressing undesired pre-nip ionization. Constant current regulation of the roller current automatically corrects for electrical parameter variations affecting the desired field levels, such as variations in the thickness of the transfer member and variations in the resistance of the roller with relative humidity.

3,781,106

OPTICAL APPARATUS FOR PRODUCING AND/OR USING PHOTOCONDUCTIVE FILM HAVING A SPECULAR SURFACE SELECTIVELY DEFORMED IN IMAGE AREAS THEREOF

Gordon Lysle, Greenlawn, N.Y., assignor to Gordon Lysle Incorporated, East Northport, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,737
Int. Cl. G03g 15/00
U.S. Cl. 355—9 12 Claims



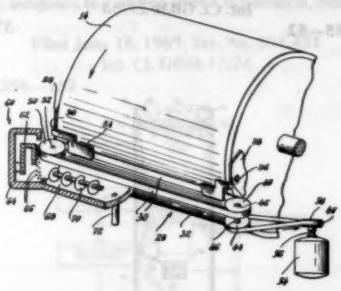
Optical apparatus to produce and/or use photoconductive and thermoplastic film having a specular surface selectively deformed in image areas thereof. A preferred form of this film is opaque. In one recording form of this apparatus an objective lens unit in an optical path defined by optical elements thereof receives a recording beam of light consisting of a bundle of light rays reflected from an image of a field of view, e.g., a flood lighted record sheet, and transmits this beam as an essentially collimated bundle of the rays bearing an image of the field of view to means holding such a film with its specular surface exposed in an optical aperture to this image-bearing beam. Electrostatic charge and heat applying means are located closely adjacent to, but spaced from the optical aperture to impose upon the film specular surface the electrostatic charge in a latent pattern corresponding to the darker areas of the image borne by the beam and to heat soften and deform by depression the electrostatically charged film surface areas which, upon cessation of radiation of the heat to this film surface, causes by cooling the temporary fixing or freezing of the deformed image darker portions to produce a rippled specular surface film. In another, projection form of the apparatus a projecting light source is associated with a beam splitter optically beyond such optical aperture and such an objective lens unit to project the bundle of light rays of an initial portion of a projection light beam from the beam splitter through the lens unit to such a rippled specular surface film exposed in the optical aperture. A secondary portion of this projection beam is then reflected back from the rippled specular surface of the film at the optical aperture along a common path through the lens unit to the beam splitter, where it is separated by the latter from the initial projection beam portion to be projected in focus to a display or read-out plane, such as a viewing screen. In still another form of the apparatus these recording and projection equipments or systems are combined to employ alternatively in the recording and projecting modes the same objective lens unit, the same film exposing optical aperture and the viewing screen which, in the recording mode, provides a support for any properly sized record sheet. A common light beam path is provided between the film exposing optical aperture and the viewing screen which has mounted therein between the beam splitter and the viewing screen a movable prism mount which selectively inserts into this path a common reflective prism in the recording mode and an amici prism in the projecting mode.

3,781,107

CLEANING APPARATUS

John Ruhland, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Aug. 9, 1972, Ser. No. 279,146
Int. Cl. G03g 15/00
U.S. Cl. 355—15 8 Claims



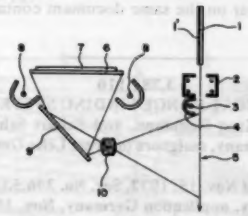
An endless loop cleaner in the form of a web or belt and which is composed of a material suitable for removal of marking material from an imaging surface. The web or belt is transported over an area of sweeping engagement with the imaging surface in a direction transverse to the longitudinal dimension of the imaging surface. After engagement, the web or belt is brought into engagement with a removal device for removing marking material from the web or belt. Alternatively, the web or belt is maintained in sweeping engagement with the imaging surface by a backing member which is positioned along an axis skewed with respect to the direction of movement of the web or belt such that a clean segment of the web or belt is continuously presented for the sweeping engagement.

3,781,108

METHOD AND APPARATUS FOR FORMING LATENT ELECTROSTATIC IMAGES

Masaya Ogawa, Abeno-ku, and Kuniki Seino, Amagasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan

Continuation of Ser. No. 850,383, Aug. 15, 1969, abandoned. This application Apr. 17, 1972, Ser. No. 244,984
Int. Cl. G03g 13/00
U.S. Cl. 355—17 4 Claims



Method and apparatus for uniformly irradiating the surface of an N-type photoconductive material to decay a uniform

surface charge thereon so that the surface charge potential lies on a substantially linear, steeply sloping portion of the surface charge potential-to-exposure time characteristic of the photoconductive material, thereby reducing the image exposure time.

3,781,109

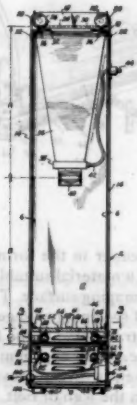
DATA ENCODING AND DECODING APPARATUS AND METHOD

George L. Mayer, Jr., New Orleans, La., and David L. Dobbins, McLean, Va., assignors to Coded Signatures Inc., New Orleans, La.

Division of Ser. No. 103,204, Dec. 31, 1970, Pat. No. 3,676,000. This application Nov. 10, 1971, Ser. No. 197,465

Int. Cl. G03b *27/68*

U.S. Cl. 355—52 **37 Claims**



Apparatus and method or system for encoding and recording coded data, and retrieving the same by decoding and display thereof for direct viewing or for viewing on a screen. The method comprises utilizing a multiple array lens, otherwise known as a "fly's eye" lens, for "scrambling" the data to be encoded and also for "unscrambling" or decoding the data. The encoding means includes photographic means for making a negative film, or a direct positive photo, of the image appearing at the back face of the encoding lens. In the case of a photographic negative, a positive print is made therefrom. The positive print, whether made directly or indirectly, is applied to a paste-up sheet, which is photographed and the negative thereof is used with a masking sheet to expose an offset printing plate. Alternatively, a positive printing plate can be made directly from the paste-up sheet and used for ink-printing the encoded data. The system includes decoding apparatus for converting the encoded data back to its original form for viewing and, if desired, display and comparison with other matter, which may appear on the same document containing the encoded data.

3,781,110

OPTICAL RANGE FINDING SYSTEM

Ludwig Leitz; Knut Heitmann, and Eckart Schneider, all of Wetzlar, Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

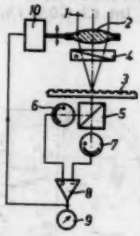
Filed Nov. 15, 1972, Ser. No. 306,535

Claims priority, application Germany, Nov. 15, 1971, P 21 56 617.6

Int. Cl. G01c *3/08*

U.S. Cl. 356—4 **22 Claims**

An optical range finding system wherein a local frequency component of the image of an object is generated and the position of the plane of maximum amplitude of the frequency component is established by an objective to produce the image, a grating located in the image space, a beam splitter for splitting the image into two components and photoelectric detectors receiving radiation which has been modulated by the



grating. The radiation constitutes at least part of each of the frequency components and the detecting means supply signals to a push-pull amplifier having a frequency equal to the local frequency. These signals are indicative of the position of the plane of maximum amplitude.

3,781,111

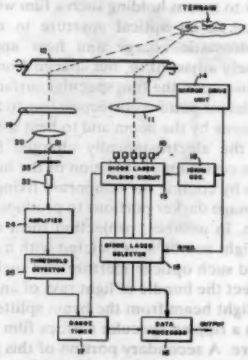
SHORT RANGE LASER OBSTACLE DETECTOR

James C. Fletcher, Administrator of the National Aeronautics & Space Administration, with respect to an invention of, and William L. Kuriger, 912 Schulze Dr., Norman, Okla.

Filed Mar. 16, 1972, Ser. No. 235,268

Int. Cl. G01c *3/08*

U.S. Cl. 356—5 **7 Claims**



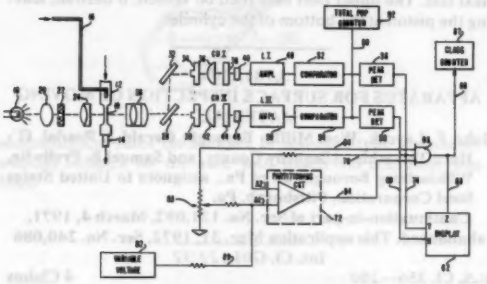
A short range obstacle detector for surface vehicles is provided by an array of laser diodes operated one at a time, one for each of a plurality of adjacent azimuth sectors. A vibrating mirror a short distance above the surface provides continuous scanning in elevation for all azimuth sectors. A diode laser selector is synchronized with the vibrating mirror to enable one diode laser to be fired by pulses from a clock pulse source a number of times during each elevation scan cycle. The time for a given pulse of light to be reflected from an obstacle and received is detected as a measure of range to the obstacle.

3,781,112

METHOD AND APPARATUS FOR ANALYSIS OF LEUKOCYTES USING LIGHT SCATTERED BY EACH LEUKOCYTE AT ABSORBING AND NON-ABSORBING WAVELENGTH

Warren Groner, Whitestone, and Wilberdan Victor George, Brooklyn, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 15, 1972, Ser. No. 315,703
Int. Cl. G01n *33/16, 21/00*
U.S. Cl. 356—39 **10 Claims**



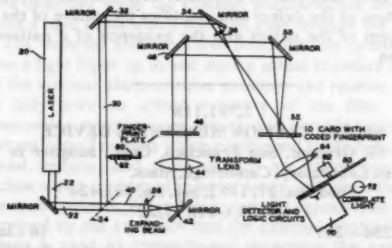
Electrical signals, originating from a pair of independent photodetectors and generated by different optical reactions to each one of a large number of leukocytes contained in a suspension and flowed sequentially at a rapid rate transversely through a beam of light, are coupled for interaction of a differential type to discriminate and indicate by display and/or counting a subclass of stained leukocytes in the suspension. The discrimination utilizes a significant increase in one of the optical reactions, which is a dark field reaction, and a reduction in the other optical reaction, which is also a dark field reaction, effecting superior discrimination, while counting the leukocytes of the subclass and unstained leukocytes of the main class. One of the optical reactions is a reaction of one of the detectors highly sensitive to light at wavelengths of stain and the other is a reaction of the other detector substantially insensitive to light at wavelengths of stain but sensitive to light at longer wavelengths. Both a method and apparatus for accomplishment of this technique of sample analysis are contemplated.

3,781,113

METHOD AND APPARATUS FOR PERSONAL IDENTIFICATION

Carlton E. Thomas, Van Nuys, Calif., assignor to KMS Industries Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 774,674, Nov. 12, 1968, abandoned. This application Oct. 26, 1971, Ser. No. 192,070
Int. Cl. G06k *9/08*
U.S. Cl. 356—71 **3 Claims**



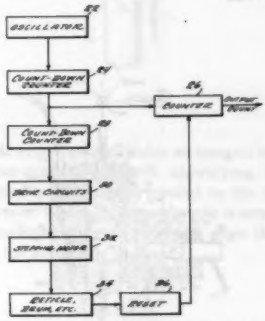
A method and apparatus for creating an encoded fingerprint card which consists of a hologram of a fingerprint created by a main illuminating beam and a reference beam on a sensitive photographic plate and the use of the encoded fingerprint in a matched filter correlator in real time wherein the fingerprint of a subject can be introduced into the system and correlated with the encoded information to verify identity between the original encoded information and the person claiming identity therewith. The system also includes an output pick-up utilizing a moving reticle and photomultiplier to determine correlation peaks for registration of identity.

3,781,114

POSITION INDICATING SYSTEM FOR INDICATING THE ANGULAR POSITION OF A CONTINUOUSLY ROTATING MEMBER UTILIZING COUNTER MEANS

Robert W. Marsh, and Alden J. Mooers, both of Minneapolis, Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 18, 1969, Ser. No. 834,421
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **11 Claims**



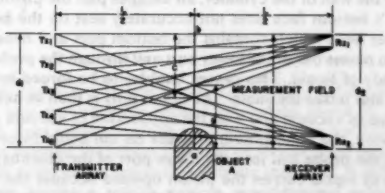
A position indicating system and more specifically an angular position indicating system for accurately indicating the angular position of a continuously rotating member wherein a stepping motor is continuously rotated to drive a reticle or other movable member and wherein a counter provides an accurate interpolation of the position of the member and of the motor between the step positions of the motor and wherein the ratio of the instantaneous count of the counter to the total count of the counter is equal to the ratio of the angular position of the stepping motor to 360°.

3,781,115

METHOD AND APPARATUS FOR NON-CONTACT SURFACE MEASUREMENT

Edwin R. Rader, and Clarence A. Ripley, Jr., both of Tallmadge, Ohio, assignors to Monitor Systems Corporation, Akron, Ohio

Filed Feb. 14, 1972, Ser. No. 225,973
Int. Cl. G01b *11/00, 11/04, 11/30*
U.S. Cl. 356—167 **18 Claims**



The invention relates to a method and apparatus to measure surfaces without contacting the surfaces. It incorporates a plu-

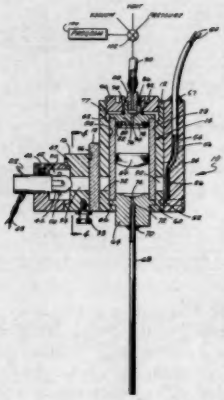
rality of light beams, means to sequentially actuate the beams and means to detect the beams as they are actuated. The surface of an object extending into the beams will interrupt one or more of the beams. The beam being partially interrupted is determined. Then the proportion of the partially interrupted beam is determined. The beams have a uniform light distribution across their width so the proportional measurement accurately determines the distance of surface intrusion. Since the position of the beam is known, a highly precise measurement of the position of the surface is achieved. If no beams are interrupted, new beam paths are established to provide a broad range of coverage. Electronic controls insure a fast response and accuracy to at least 0.0001 inches.

3,781,116

COLORIMETER WITH AUTOMATIC CUVETTE

Alan Richardson Jones, Miami, Fla., assignor to Coulter Chemistry, Inc., Maunabo, P.R.

Filed Oct. 14, 1971, Ser. No. 189,312
Int. Cl. G01n *1/10, 1/14*
U.S. Cl. 356—180 **18 Claims**



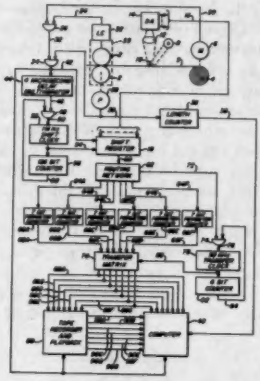
A colorimeter with a source of light arranged to have its beam directed through the transparent walls of a cuvette to a photoresponsive device to measure the absorbance of the liquid in the cuvette. The cuvette is a cylinder of glass or the like having an upper central port in its upper cylinder head surrounded by an O-ring and a lower central port in its lower cylinder head connected with a depending probe. A free moving piston is movable in the chamber of the cuvette but has an outer diameter slightly less than the inner diameter of the cylinder. The upper port is adapted to be connected to a source of vacuum or pressure alternatively. When the probe is dipped into a body of liquid with the upper port connected to a source of pressure, the piston moves down to the bottom head of the cylinder and due to its dimensional difference relative to the wall of the cylinder, air escapes past the piston. The piston's bottom face does not accurately seat on the bottom cylinder head which contains the bottom port and hence the air also passes out of the lower port and through the probe into the body of liquid. This causes bubbles to be forced into the liquid and mixes the same. The upper port is then switched to a source of vacuum and with the application of vacuum above the piston, the atmospheric pressure on the liquid forces it to rise in the probe and into the lower port of the chamber. The inrush of liquid carries the piston upward because the space between the piston and the wall of the cylinder is substantially sealed by capillary action of the liquid. The piston is preferably formed of carbon and hence is normally of a specific gravity greater than that of the liquid, but it rises with the liquid on account of the capillary force mentioned. When the piston reaches the upper head of the cylinder, it is sucked against the O-ring and is sealed thereat. So long as vacuum is applied to the upper port this situation obtains. During this period of time with the chamber filled with liquid, the absorbance of the liquid is measured. Thereafter, the upper port is once more switched to a source of pressure. This drives the piston and liquid downward until the lower head is reached. The continued application of air pressure drives all vestiges of liquid past the piston due to its sloppy fit within the cylinder and out of the probe, clearing the cuvette and probe for the next test. The upper port may then be vented, if desired, leaving the piston at the bottom of the cylinder.

3,781,117

APPARATUS FOR SURFACE INSPECTION OF MOVING MATERIAL

John F. Laycak, West Mifflin Borough; Gerald J. Readal, O'Hara Township, Allegheny County, and Samuel B. Prellwitz, Wilkinsburg Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 121,092, March 4, 1971, abandoned. This application Mar. 31, 1972, Ser. No. 240,086
Int. Cl. G01n *21/32*
U.S. Cl. 356—200 **4 Claims**



An inspection system for the surface of moving material where defects have a different optical appearance than the remainder of the strip. A plurality of photosensitive diodes positioned across the material detects defects periodically. Diode outputs are counted to identify the perimeter of a defect for each scan line. A computer determines the recognition vectors of the defect and identifies the nature of the defect, extent of the defect and the existence of a pattern of repetition.

3,781,118

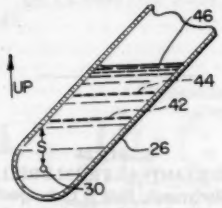
SEDIMENTATION MEASURING DEVICE

Michael M. Graham, San Francisco, Calif., assignor to The Heyman Laboratory, Cambridge, Mass.

Filed Oct. 27, 1972, Ser. No. 301,424
Int. Cl. G01n *21/22*
U.S. Cl. 356—201 **16 Claims**

Novel apparatus and process for increasing the reliability of short term sedimentation tests such as those carried out by the measurement of light transmitted through a liquid bearing the

falling sediment. A particular advantage of the invention is that it provides a simple and inexpensive means for measuring



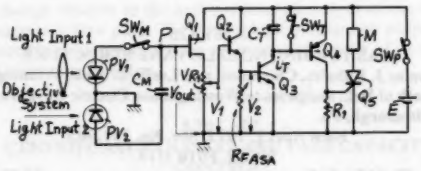
sedimentation rates on samples in test-tube-type containers without reliance on the care with which the container was filled.

3,781,119

DUAL LIGHT-MEASUREMENT AND COMPENSATION CIRCUITRY FOR CAMERAS

Chiharu Mori, Tokyo, Japan, assignor to Asahi Kogaru Kogyo Kabushiki Kaisha, Itabashi-ku, Tokyo-to, Japan

Filed Feb. 9, 1972, Ser. No. 224,719
Claims priority, application Japan, Feb. 22, 1971, 46/8483
Int. Cl. G01j 1/42, 1/10
U.S. Cl. 356—222 **9 Claims**



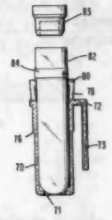
A light-measurement circuit to be used with cameras for determining the extent to which film is exposed. The light-measurement circuit has internal and external photosensitive structures for respectively receiving light inputs from an object to be photographed. The internal photosensitive structure receives the light input after the latter has passed through the camera objective while the external photosensitive structure receives a light input which does not pass through the objective. The external photosensitive structure can continue to receive a light input up to and during actual exposure of film while the internal photosensitive structure can receive a light input only prior to actual exposure of the film. These photosensitive structures are arranged to provide logarithmically transformed outputs which correspond to the light inputs received thereby, and these outputs are transmitted to a capacitor which is charged in accordance with the difference between the outputs. When film is actually exposed, an output determined by the capacitor and the external photosensitive structure is used to compute and determine the extent to which film is exposed, and as a result the output from the external photosensitive structure is compensated in accordance with the output from the internal photosensitive structure.

3,781,120

SELF-LOCATING SAMPLE RECEPTACLE HAVING INTEGRAL IDENTIFICATION LABEL

Alvin Engelhardt, Nanuet, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Division of Ser. No. 72,143, Sept. 14, 1970, Pat. No. 3,680,976, which is a continuation-in-part of Ser. No. 830,059, June 3, 1969, abandoned. This application May 3, 1972, Ser. No. 250,187
Int. Cl. G01n 21/16; B04b 9/12
U.S. Cl. 356—244 **13 Claims**



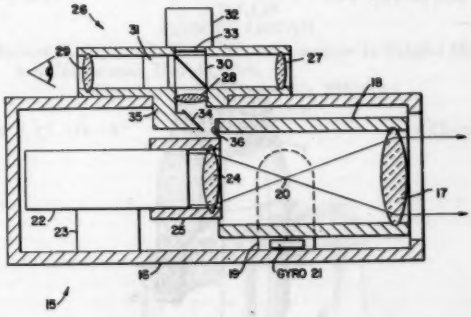
A liquid sample receptacle includes an integral label portion carrying machine-readable indicia identifying the sample source and located substantially parallel to the longitudinal axis of a cup portion. The sample receptacle is structured with respect to the turntable unit to properly align the machine-readable indicia for automatic readout.

3,781,121

STABILIZED LIGHT BEAM PROJECTION SYSTEM

Richard A. Gross, San Jose, Calif., assignor to Mark Systems, Inc., Cupertino, Calif.

Filed June 22, 1970, Ser. No. 48,395
Int. Cl. G01c 9/02
U.S. Cl. 356—247 **10 Claims**

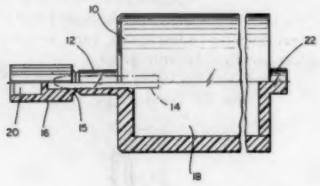


A laser stabilizing system having an inertially stabilized projection lens mounted for pivotal movement about its focal point. A light source, such as a laser, and means for focusing the light emitted therefrom to a real or virtual point image at the focal point of the projection lens are provided. A spotting telescope having a reticle pattern superimposed upon the image visible therethrough, the reticle pattern being optically coupled to the output direction of the device may also be provided.

3,781,122
ONE PIECE MARKER BODY WITH HERMETICALLY SEALED REMOVABLE CAP

James H. Chesseman, Laurel Springs, N.J., assignor to Graphic Controls Corporation, Buffalo, N.Y.

Filed Oct. 10, 1972, Ser. No. 296,258
Int. Cl. B43k 9/00
U.S. Cl. 401—202 3 Claims

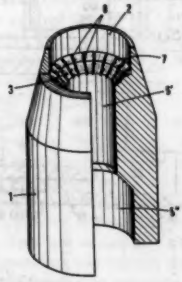


Hermetically sealed plastic marker body includes a nib-holding portion with a removable closure cap projecting therefrom and separated therefrom by a severable reduced wall thickness segment. In preferred embodiments, the removable closure includes mating recesses or other shapes to fit over the nib-holding body portion, thus acting as a removable cap, and over another portion of the body acting as a storage holder for the cap when not used to cover the nib-holding portion.

3,781,123
BALL-POINT PENS

Georg Linz, Silberstrasse 12, Nurnberg, and Lothar Sommer, Schlesierstrasse 5, Katzwang near Nurnberg, both of Germany

Continuation of Ser. No. 17,018, March 9, 1970, abandoned, which is a continuation of Ser. No. 633,873, April 26, 1967, abandoned. This application Nov. 30, 1972, Ser. No. 310,781
Claims priority, application Germany, Apr. 26, 1966, L 53,436
Int. Cl. B43k 7/10
U.S. Cl. 401—216 11 Claims

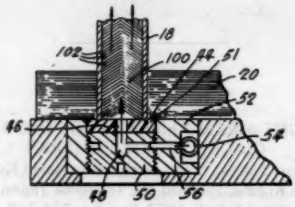


In a ball-point pen having a ball housing including a support wall and a bearing surface for seating a ball, and means at one end of the ball housing for communicating into a reservoir containing a pasty writing medium, a plurality of open channels are formed in the bearing surface for conducting the pasty writing medium from the reservoir to the ball, the cross sectional area of each open channel being less than 1,000 square microns, so that the capillary attraction between the open channels and the writing medium is great enough to move the writing medium from the reservoir to the ball against the force of gravity. The support wall and bearing surface are preferably dimensioned to define an annular collecting groove communicating between the surface of the ball and each of the open channels.

3,781,124
PAPER PLUG REMOVAL FROM DRILLED REAMS

Alistair Kenyon Bodycomb, Baie D'Urfe, Quebec, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Feb. 22, 1972, Ser. No. 228,043
Int. Cl. B23b 47/34
U.S. Cl. 408—61 2 Claims

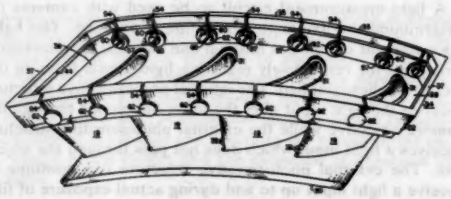


A device for drilling reams of paper utilizing a hollow drill and compressed air to eject the plugs formed by the drill up through the drill to an accumulating station.

3,781,125
GAS TURBINE NOZZLE VANE STRUCTURE

Thomas J. Rahaim, Claymont, and Leslie G. Kish, Wilmington, both of Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1972, Ser. No. 241,943
Int. Cl. F01d 5/14
U.S. Cl. 415—115 10 Claims



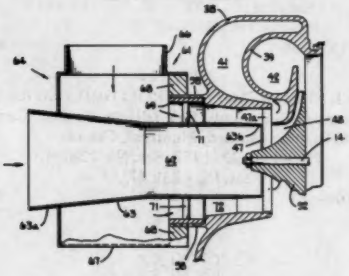
A nozzle vane structure for a gas turbine having a cavity in the outer shroud structure acting as a plenum chamber that provides pressurized coolant fluid to the vanes, and in which the internal stress effect due to large temperature gradients is minimized by a key-hole shaped slotted portion in the outer shroud having a thin walled sleeve split as its periphery and attached thereto and receiving a threaded sealing member therein to restrict coolant flow therepast during deformation incident to operation.

3,781,126

TURBOCHARGER COMPRESSOR WITH DUAL INLET AND COLLECTOR CHAMBERS

Edward F. Benisek, Indianapolis, Ind., assignor to Wallace-Murry Corporation, New York, N.Y.

Filed June 15, 1972, Ser. No. 263,009
Int. Cl. F04d *1/10, 29/58*
U.S. Cl. 415—143 4 Claims



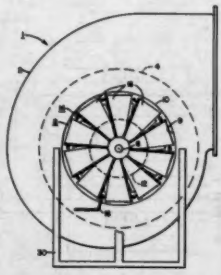
Disclosed is a single stage, centrifugal compressor component of a turbocharger for an internal combustion engine in which the vanes of the compressor wheel are formed to provide frontal vane portions extending radially beyond the adjoining vane portions. The intake for the compressor is formed to provide dual, discrete intake passages, one for the radially extending vane portions and one for the adjoining vane portions. An internal wall of the compressor wheel cover forms two discrete chambers or passages, one accommodating air flow induced by the radially extending vane portions, the other accommodating flow induced by the adjoining vane portions. The dual flow paths thus provided through the compressor component permits drawing cool, ambient air through an externally located heat exchanger and then into the intake of one compressor flow path, this air flow passing in heat exchange relation to the high pressure air output of the other compressor flow path. The cooled high-pressure air output, is injected as charge air into the air induction system of an internal combustion engine.

3,781,127

CENTRIFUGAL FAN INLET AND VANE CAPACITY CONTROL

Carl O. Wood, Needham Heights, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1972, Ser. No. 262,868
Int. Cl. F01d *7/00, 7/14*
U.S. Cl. 415—147 4 Claims



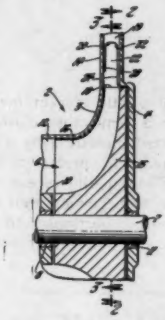
This invention relates to a centrifugal fan having an inlet cone and a rotating fan wheel, and more particularly to a centrifugal fan inlet capacity control. The capacity control consists of a plurality of spin inducing inlet vanes and means to pivotably support the vanes circumferentially around the outer wall of the inlet cone. The vanes may be pivoted in unison through their respective pivot axes which are adjacent the periphery of the inlet cone and generally parallel to the cone outer wall. As the vanes are pivoted away from the outer inlet cone wall, the induced spin can be thereby increased and also the volume of gas flowing through the inlet cone can be reduced.

3,781,128

CENTRIFUGAL COMPRESSOR DIFFUSER

Phiroze Bandukwalla, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,133
Int. Cl. F04d *29/44, 17/60*
U.S. Cl. 415—211 3 Claims



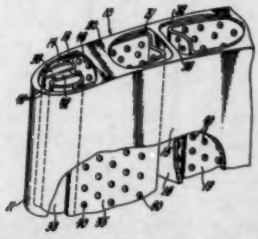
The diffuser of a centrifugal compressor having an unshrouded rotor has boundary layer fences on the walls bounding the diffuser in advance of the diffuser vanes. These vanes are directed across the direction of flow of boundary layer air on the diffuser wall and curve into the direction of the diffuser vanes as they merge with the leading edge of the vanes.

3,781,129

COOLED AIRFOIL

Robert H. Aspinwall, Zionsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1972, Ser. No. 289,417
Int. Cl. F01d *5/18*
U.S. Cl. 416—97 4 Claims



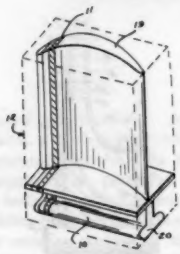
A hollow air-cooled turbine blade or vane includes a liner for bringing cooling air into the blade and discharging it through two cooling air exhaust tubes disposed near the interi-

or of the leading edge and extending spanwise of the blade. These tubes define between them a slot nozzle for discharge of air from the liner for impingement cooling of the leading edge. The exhaust tubes have air entrance holes adjacent the leading edge. The pressure drop to cause the circulation of the air out through the tubes is caused by centrifugal force or pressure drop across the stage or both.

3,781,130
TURBINE BLADE MANUFACTURED OF SELF-CARRYING LAMINATES

Wayne A. Tall, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 27, 1972, Ser. No. 266,810
Int. Cl. F01d *5/08*
U.S. Cl. 416—97 **4 Claims**

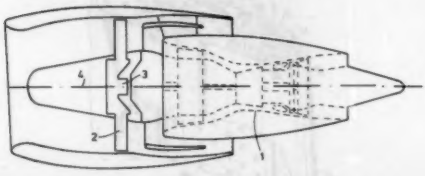


A turbine blade manufactured from a series of laminates each oriented in a radial-tangential plane for carrying its own centrifugal loads, and partially preformed by being initially cut into a shape suitable for stacking and bonding and being further perforated along boundaries outlining the final blade shape desired for facilitating the machine removal of excess material therefrom. Additional perforations are also incorporated in each laminate for outlining a series of built-in coolant passages.

3,781,131
VARIABLE PITCH ROTARY BLADING

David Roberts McMurtry, Bristol, England, assignor to Rolls-Royce, Limited, London, England

Filed Apr. 28, 1972, Ser. No. 248,410
Claims priority, application Great Britain, May 6, 1971, 14,173/71
Int. Cl. B64c *11/06*
U.S. Cl. 416—155 **4 Claims**

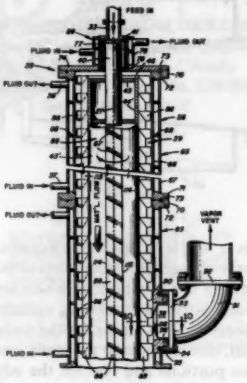


In a variable pitch fan gas turbine engine an actuator for changing the pitch of the blades is connected to each blade through two driving connections in parallel. The first driving connection is a relatively flexible shaft, and the second is a relatively stiff hollow shaft which surrounds the first shaft and is connected to it by means of splines. This arrangement allows for bending of the first-mentioned shaft and tilting of the hollow shaft to provide for relative movements between the actuator and the blades.

3,781,132
DEVOLATILIZER ROTOR ASSEMBLY

George A. Latinen, deceased, late of Springfield, Mass. (by May V. Latinen, administratrix), assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1971, Ser. No. 172,187
Int. Cl. F04d *29/18*
U.S. Cl. 416—200 **6 Claims**

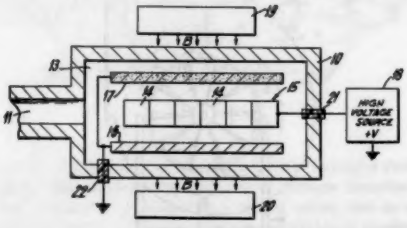


A rotor assembly suitable for use in a devolatilizer for processing relatively viscous materials to separate volatiles therefrom is described. The rotor assembly permits a high mechanical energy input to materials being treated, has low surging characteristics, and permits operating at relatively high speeds with low foaming tendencies. The rotor assembly employs a plurality of circumferentially positioned, radially projecting, plow blades arranged about a central shaft into a plurality of axially extending rows. The total blade land surface areas of the individual plow blades is controlled, as is the rotor assembly length to diameter ratio.

3,781,133
SPUTTER ION PUMPS

Lewis D. Hall, Palo Alto, Calif., assignor to Veeco Instruments, Inc., Plainview, N.Y.

Filed Mar. 6, 1972, Ser. No. 231,828
Int. Cl. F04b *37/02*
U.S. Cl. 417—49 **3 Claims**



To increase the ionization in sputter ion pumps, a relatively high vapor pressure metal is provided which vaporizes when

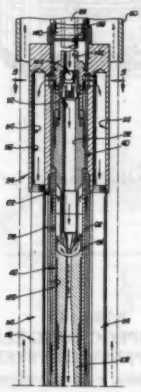
heated by the discharge, the vaporized atoms are ionized and accelerated to the sputtering electrode to enhance the sputtering action which in turn increases the pump speed.

3,781,134

WELL PUMPING SYSTEM WITH PARALLEL JET PUMPS

Francis Barton Brown, La Crescenta, and Vitolis Budrys, La Mirada, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed May 1, 1972, Ser. No. 249,086
Int. Cl. F04f 5/02
U.S. Cl. 417—176 5 Claims



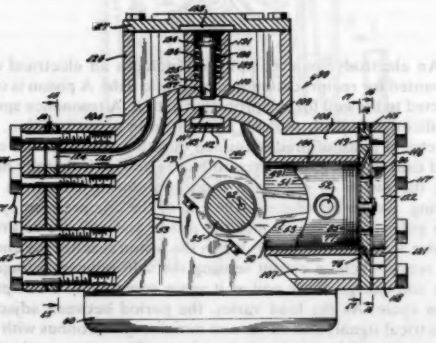
A well pumping system which includes a pump unit movable into and out of a well hydraulically and including a plurality of jet pumps connected in parallel. The jet pumps receive power fluid from a common power tubing through which the pump unit is movable between the surface and its operating position. The jet pumps discharge pressurized well fluid and spent power fluid into a common production tubing leading to the surface, the production tubing being the well casing in the particular embodiment disclosed.

3,781,135

REFRIGERANT COMPRESSOR FOR VEHICLES

Claude H. Nickell, Dearborn, Mich., assignor to Claude H. Nickell, Dearborn; Winfred D. Weldon, Detroit; Manuel Pinko and Adam Pianga, Dearborn, Mich.

Filed May 19, 1972, Ser. No. 255,235
Int. Cl. F04b 49/00
U.S. Cl. 417—295 8 Claims



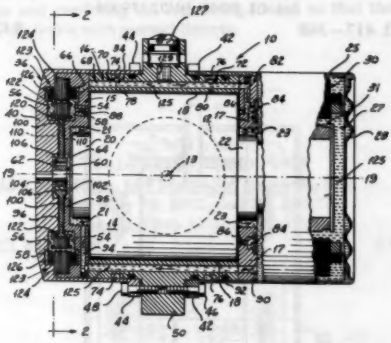
Compressor apparatus for use with a variable speed power plant to compress refrigerant vapor in an air conditioning system. The compressor includes a plurality of cylinders having pistons which are sequentially operated. Each of the cylinders is provided with refrigerant vapor from multiple chambers of limited capacity in communication with each other and with a plenum chamber of the compressor by metering structures so that the volume of refrigerant vapor being compressed is directly proportional to the speed of the vehicle and the condenser pressure of the system.

3,781,136

COMBINATION CENTRIFUGAL AND VISCOUS SHEAR ROTARY PUMP

Oscar D. Jacobson, 1142 Woodycrest Ave., New York, N.Y.

Division of Ser. No. 807,232, March 14, 1969, Pat. No. 3,643,519. This application June 30, 1970, Ser. No. 60,186
Int. Cl. F04b 35/04; F03b 5/00
U.S. Cl. 417—353 3 Claims



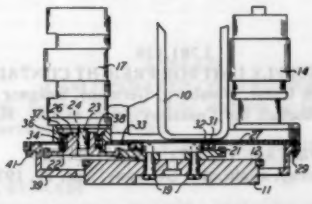
A combination centrifugal and viscous shear rotary pump of a disc impeller type with extremely shallow spiral grooves fabricated in both sides of the disk and in close proximity to smooth stator surfaces so as to cause a high viscous shear in a low viscosity fluid to effect an improved pressure rise in the spiral grooves as the disk rotates in a sense aiding in a centrifugal pumping action of the impeller disk. In operation, the disk floats hydrodynamically between the stator faces and on a center journal bearing so that there are no wear points during operation of the rotary pump which is particularly adapted for use in an arrangement for supplying fluid pressure to hydrostatically supported bearings of a gyroscope.

3,781,137

MOUNTING AND DRIVE FOR A HYDRAULIC PUMP ON AN ENGINE

William A. Engstrom, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 11, 1972, Ser. No. 313,783
Int. Cl. F04b 17/00; F16h 37/00
U.S. Cl. 417—360 6 Claims



A mounting and drive for a hydraulic pump on an engine having a crankshaft and a flywheel gear. Additional gear

means are in driving relation with the flywheel gear and extend from the crankshaft to the pump for powering the pump directly from the engine. A mounting plate is secured to the engine, and a bearing support and a pump bearing are on the mounting plate. A pump gear is supported in the bearing, and the pump shaft connects with the pump gear and is removable therefrom for removal or replacement of the pump. Also, the flywheel and the gears extending to the pump are removable for altering the gear ratio.

3,781,138

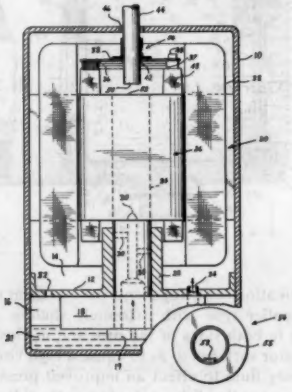
SEAL SLEEVE FOR OIL SEPARATOR

Frederich Otto Bellmer, Stanhope, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed Apr. 24, 1972, Ser. No. 246,768

Int. Cl. F04b *39/02, 39/06*

U.S. Cl. 417—368 **8 Claims**



In a hermetically sealed motor-compressor unit, a gas discharge tube extends into said unit to a position between the windings of the motor rotor. A circular rotor plate is mounted to the end of the rotor and has an opening formed therein through which the discharge tube is disposed. A flanged sleeve is positioned around the discharge tube and is held in place on the tube by spring tension of the sleeve itself. A flange portion of the sleeve seals a gap between the rotor plate and the discharge tube to prevent the flow of refrigerant gas and oil therethrough. The rotor plate is positioned so as to separate entrained oil from the refrigerant gas and is utilized for motor cooling.

3,781,139

ENERGY SUPPLY UNIT FOR FREIGHT CONTAINERS

Hans-Heinrich Lohse, Hamburg, Germany, assignor to Contrans Gesellschaft fur Containerverken m.b.H., Hamburg, Germany

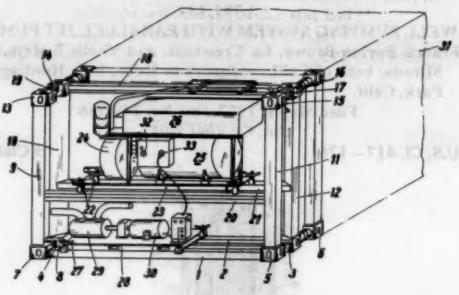
Filed Apr. 17, 1972, Ser. No. 244,605

Claims priority, application Germany, Apr. 19, 1971, G 71 14 870.4

Int. Cl. F04b *39/00*

U.S. Cl. 417—313 **7 Claims**

An energy supply unit for freight containers consisting of a structure having an internal combustion engine therein and at least one transducer. The structure is the same height as the



container and has a detachable means for rigid connection to said container.

3,781,140

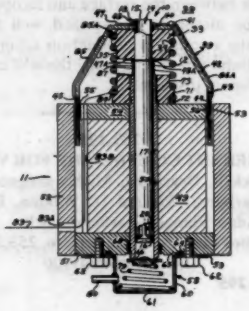
SYNCHRONOUS RECIPROCATING ELECTRODYNAMIC COMPRESSOR SYSTEM

David J. Gladden, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed May 26, 1971, Ser. No. 147,026

Int. Cl. F04b *35/04*

U.S. Cl. 417—326 **9 Claims**

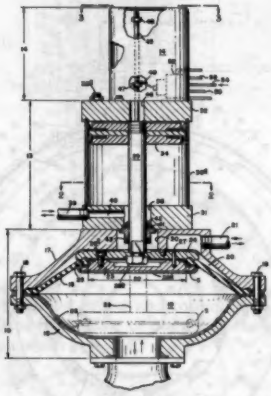


An electrodynamic compressor includes an electrical coil mounted for reciprocation in a magnetic field. A piston is connected to the coil for reciprocation with it. A resonance spring resiliently supports the coil and piston in a rest position. An electrical pulse of predetermined duration energizes the coil, and causes a magnetic force to be exerted on it thereby moving the piston to compress fluid and storing energy in the spring. As the piston nears the end of the compression cycle, the pulse is terminated and the piston and coil are returned under action of the spring. When the piston reaches the end of its return cycle, a circuit sensing the self-induced voltage in the coil energizes the coil as it again commences a compression cycle. As the load varies, the period between adjacent electrical signals also varies and remains synchronous with the cycle time of the mechanical reciprocating system so that the period of the electrical signal is always equal to the period of the natural oscillating frequency of the mechanical system.

3,781,141
AIR PRESSURE ACTUATED SINGLE-ACTING DIAPHRAGM PUMP

Robert A. Schall, Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed July 12, 1971, Ser. No. 161,464
Int. Cl. F16j 3/00; F04b 43/00
U.S. Cl. 417—395 3 Claims

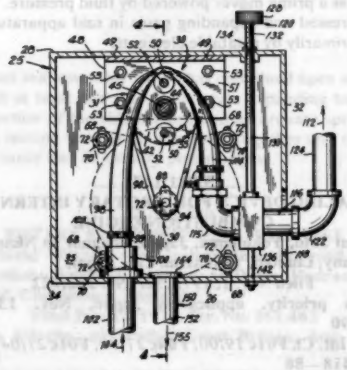


A single-acting fluid pressure actuated diaphragm pump wherein a high suction lift is attainable by connecting the pump diaphragm to a piston or auxiliary diaphragm operating in an auxiliary fluid pressure-actuated chamber connected to the pump housing, and equipped with a control system for maintaining the pump operating cycle, which control system in turn is actuated by the pump diaphragm.

3,781,142
PERISTALIC PUMP WITH ADJUSTABLE TENSIONING MEANS

Leon A. Zweig, North Bellmore, N.Y., assignor to Flow Technology Corp., Farmingdale, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,746
Int. Cl. F04b 43/08, 43/12, 45/06
U.S. Cl. 417—477 26 Claims

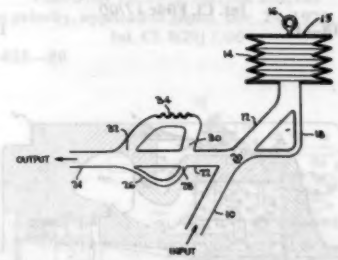


The construction of a pumping system adapted for utilization in transfering fluids primarily in the graphic art. The pumping system includes housing means having an inlet opening and an outlet opening extending therethrough with pumping means mounted within the housing means and operatively connected with the inlet and outlet openings to receive a fluid in the inlet opening and pumping same through the pumping means to exit through the outlet opening, the said pumping means including, a rotary structure rotatably mounted within the housing means and having a plurality of spaced rotary members mounted thereupon for rotation therewith and independent rotation thereto and a fluid conducting tube positioned in relationship to said rollers as to be sequencially engaged, and rotating means coupled to said rotary structure. Coupling means are provided at each end of the fluid conducting tube for operatively connecting to the inlet and outlet openings, with regulating means associated with the fluid and movement relative to the rotary members wherein the tension in the conducting tube may be regulated. Guide means is associated with the regulating means to control the direction of movement thereof during adjustment, the guide means includes a pair of spaced apart supports secured to the housing means and confining the regulating means so that the latter may ride freely with respect thereto.

3,781,143
VALVELESS FLUID PUMP

Donald E. Wortman, 609 Muriel St., Rockville, Md.

Filed May 30, 1972, Ser. No. 257,736
Int. Cl. F04b 39/10; F15c 1/08
U.S. Cl. 417—557 4 Claims



A driven fluid oscillator pump with no mechanical valves. Fluid flow is directed into a capacitance chamber of a modified RCR fluid oscillator and expelled such that a pulsed pumping action results. There are no valves in the pump, thus permitting corrosive and other such fluids to be pumped without damage or breakdown. The pump incorporates a fluid diode to prevent backloading of the capacitance chamber when it is expanding.

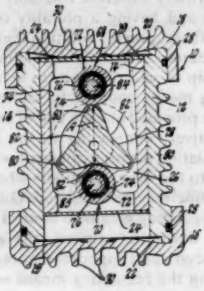
3,781,144
CAM OPERATED COMPRESSOR

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1972, Ser. No. 301,478
Int. Cl. F04b 21/04, 39/10
U.S. Cl. 417—525 3 Claims

A refrigerant compressor with a dual ended and double acting piston which supports two roller bearings adjacent its ends. A cam portion on a drive shaft has diametrically opposite

large radius lobe portions and smaller radius portions which are positioned between the two roller bearings. The roller bearings are supported on eccentric pins which adjustably



vary the distance therebetween for easier assembly of the drive shaft and simple adjustment of the clearance between the bearings and the surface of the cam portion.

3,781,145

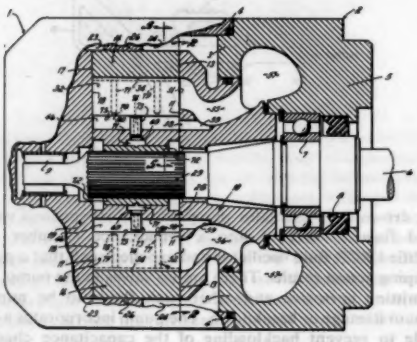
VANE PUMP WITH PRESSURE RAMP TRACKING ASSIST

Jack W. Wilcox, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed May 10, 1972, Ser. No. 252,006

Int. Cl. F04c *17/00*

U.S. Cl. 418—1 **16 Claims**



Means for preventing vane "skip" or seperation from the cam surface of a vane pump, at the inner end of the pressure ramp on the cam surface. Flow restricting orifice means are provided for the respective vanes, such that the inward movement of the vane in its rotor slot in the pressure zone causes fluid to be displaced from the inner end of the vane slot through the orifice means, thereby establishing a pressure differential force beneath the vane which resists such inward vane movement. The increased pressure at the inner end of the vane slot is limited by partial release to the pressure port through an opening in the cheek plate, which communicates with the inner ends of the vane slots as the vanes are passing through the pressure zone at those vane positions at which the tracking assist is not advantageous.

3,781,146

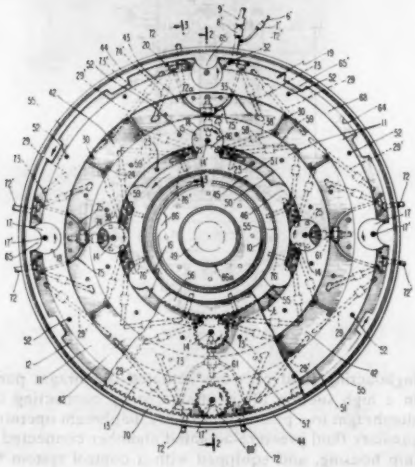
ROTARY APPARATUS HAVING TWO ROTORS ENGAGING ROTARY DIVIDERS IN A HOUSING

Kenneth Clayton Bates, 28 Scenic Dr., Poughkeepsie, N.Y.

Continuation-in-part of Ser. No. 40,720, May 26, 1970, which is a continuation of Ser. No. 658,175, Aug. 3, 1967, abandoned. This application Aug. 19, 1970, Ser. No. 65,233

Int. Cl. F01c *1/30, 11/00*; F04c *23/00*

U.S. Cl. 418—6 **8 Claims**



A readily reversible rotary apparatus combinable with an aircraft landing gear and other vehicles comprising a first mechanism selectively operable either as a compressor or as a prime mover selectively powered either by fluid pressure or by combustion of a confined fuel-air mixture under pressure and further comprising a second mechanism driven by the first for compressing air or a combustible mixture for controlled introduction into the expansion or combustion chambers of the first mechanism, said second mechanism being adapted for use also as a prime mover powered by fluid pressure. The flow of compressed and expanding gases in said apparatus is controlled primarily by rotatable elements.

3,781,147

SEALING DEVICE FOR A ROTARY INTERNAL COMBUSTION ENGINE

Munefumi Sato, Yokohama, Japan, assignor to Nisson Motor Company, Limited, Yokohama City, Japan

Filed Nov. 1, 1972, Ser. No. 302,722

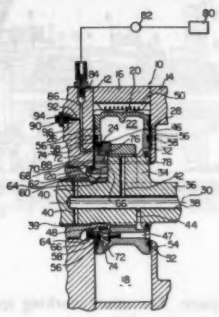
Claims priority, application Japan, Nov. 13, 1971, 46/106190

Int. Cl. F01c *19/00*; F04c *27/00*; F01c *21/04*

U.S. Cl. 418—88 **2 Claims**

A sealing device for a rotary internal combustion engine of the type adapted for effectively sealing the engine from oil leakage by utilizing blow-by gases from the engine. The sealing device comprises a source of air under pressure, and an air supply passageway formed in a housing of the engine which is

connected to the source of air under pressure. The air supply passageway opens to a space in which the blow-by gases are introduced to urge an oil seal ring to a position to prevent



leakage of oil from the engine and continuously supplies into that space air under pressure of constant pressure level from the source of air under pressure.

3,781,148

APEX SEAL ASSEMBLY OF A ROTARY PISTON ENGINE

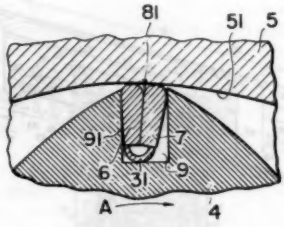
Hiroshi Sakamaki, Tochigi, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1972, Ser. No. 233,688

Claims priority, application Japan, Mar. 12, 19?1, 46/13586

Int. Cl. F01c *19/02*

U.S. Cl. 418—117 **4 Claims**



An apex seal assembly which has combined apex seal members with at least one side at an angle expanding toward the lower portion of the side surface and an arcuate spring of U-shape in section to hold the members together and in contact with the inner wall of a rotary piston engine.

3,781,149

ROTARY FLUID-PRESSURE MACHINES

Cedric David Weaver, and Graham John Toogood, both of Cheltenham, England, assignors to Dowty Hydraulic Units Limited, Cheltenham, England

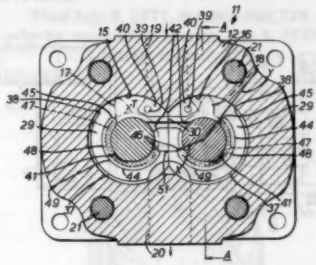
Filed July 12, 1971, Ser. No. 161,463

Claims priority, application Great Britain, Aug. 1, 1970, 37250/70

Int. Cl. F01c *19/08*

U.S. Cl. 418—131 **1 Claim**

A rotary fluid-pressure machine includes a casing, toothed intermeshing rotors supported for rotation in the casing, and wear plate means having a first side-face-portion and a second side-face-portion. The one portion is substantially co-planar with the other and both portions are engageable with a side-face of a rotor. The second side-face-portion is of arcuate form, has better wear-resisting properties than said first side-



face-portion and has an outer periphery at a radial distance from the rotational axis of the rotor which is substantially the same as the radius of the trace of the roots of the teeth of the rotor. A part of the first side-face-portion crosses the gap between the two ends of the second side-face portion.

3,781,150

APPARATUS FOR PRODUCING MULTILAYER FIBROUS STRUCTURES

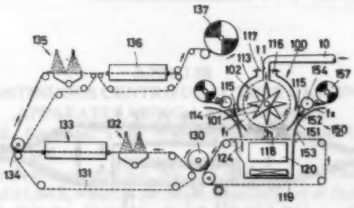
Hisashi Matsumura; Tadanori Samejima; Hiroshi Orito, all of Fujinomiya-shi, and Hisashi Ochiari, Numazu-shi, all of Japan, assignors to Honshu Paper Company Limited, Tokyo, Japan

Filed June 13, 1972, Ser. No. 262,185

Claims priority, application Japan, Dec. 29, 1971, 46/1229

Int. Cl. B29j *5/00*

U.S. Cl. 425—80 **2 Claims**



Apparatus for producing multilayer fibrous mats is provided which can mix and form alternate short and long fiber layers continuously in a single stage of process, both layers being held together by interfiber bonds at their interfaces under the influence of suction air. The apparatus is comprised of a disintegrator unit producing a short fiber layer and a defibrator unit operatively associated therewith for producing a long fiber layer, both units designed to deposit the respective fibers on a conveyor moving above suction boxes.

3,781,151

APPARATUS FOR AGGLOMERATING PARTICULATE MATERIAL

LeRoy S. Harris, Rolling Meadows, Ill., assignor to K-G Industries, Inc., Rosemont, Ill.

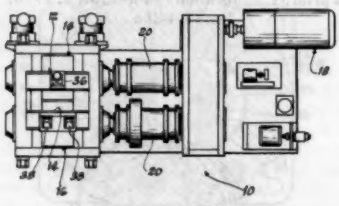
Filed Feb. 7, 1972, Ser. No. 224,196

Int. Cl. B29c *15/00*; B30b *11/18*

U.S. Cl. 425—145 **21 Claims**

An apparatus for processing particulate material wherein the material is fed between compacting rolls. The means for feeding the material comprise at least three feed screws

aligned so that the material is fed along the length of the nip of the rolls. The drive means for the feed screws comprise a variable drive means for intermediate screws whereby the intermediate screw operation can be adjusted relative to the screws



on the outside of the intermediate screws to provide control which achieves uniformity in the agglomerated product. The operation of the respective drive means may be automatically controlled by detecting means responsive to operating conditions.

3,781,152

APPARATUS FOR PRECIPITATING A LAYER OF SEMICONDUCTOR MATERIAL FROM A GASEOUS COMPOUND OF THE SEMICONDUCTOR MATERIAL

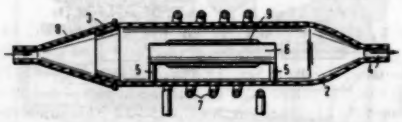
Wolfgang Keller, Pretzfeld; Arno Kersting, Erlangen, and Konrad Reuschel, Vaterstetten, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Erlanger, Berlin, Germany

Division of Ser. No. 872,278, Oct. 29, 1969. This application Jan. 31, 1972, Ser. No. 222,127

Claims priority, application Germany, Oct. 30, 1968, P 18 05 970.6

Int. Cl. B29c *23/00*; B29d *23/00*

U.S. Cl. 425—174.8 R **7 Claims**



Apparatus for producing a hollow semiconductor body, particularly of silicon. Semiconductor is precipitated on the outer surface of a heated carrier body. The carrier body is thereafter removed without damaging the semiconductor body.

3,781,153

DISK EXTRUDER FOR PROCESSING POLYMERIC MATERIALS

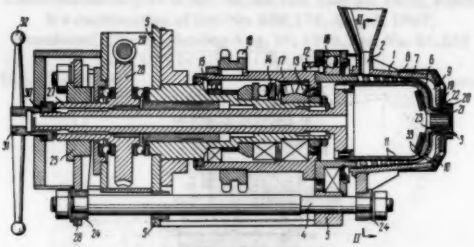
Jury Efimovich Lukach, ulitsa Tolstogo, 15, kv. 43; Vladimir Alexeevich Senatos, Brest-Litovsky prospekt, 106/2, kv. 182, and Arkady Demyanovich Petukhov, ulitsa Saljutnaya, 19, kv. 77, all of Kiev, U.S.S.R.

Filed Dec. 22, 1971, Ser. No. 210,896

Int. Cl. B29h *1/10*

U.S. Cl. 425—207 **4 Claims**

A disk extruder for processing polymeric materials, comprising a movable disk mounted in a housing and having the shape of a cup accommodating a stationary disk. Confined between the movable disk and the housing is one working space, and between the movable and stationary disks —



another working space. The other working space is fed with the material to be processed through cuts made in the side wall of the movable disk.

3,781,154

DEVICE FOR FORMING SHEAR KEYWAYS ON SIDES OF EXTRUDED SLABS AND THE LIKE

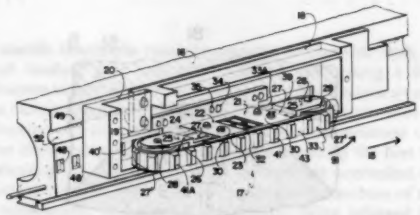
Denys Herbert, and Ernst Martens, both of Winnipeg, Manitoba, Canada, assignors to Spiroll Corporation Ltd., Winnipeg, Manitoba, Canada

Filed June 22, 1972, Ser. No. 265,150

Claims priority, application Great Britain, July 2, 1971, 31,221/71

Int. Cl. B29g *2/02*

U.S. Cl. 425—329 **33 Claims**



An endless belt with projections on the outer surface is mounted on the side plates of a concrete slab making machine so that as the slab is formed, horizontal shear keyways are formed in the sides of the slab. When adjacent slabs are grouted, the keyways and the grout form horizontal shear key assemblies which prevent horizontal and vertical movement from occurring from between slabs.

3,781,155

APPARATUS FOR INSERTING A FLEXIBLE PREFORM IN A MOLD

Arthur J. Wiltshire, 352 Dumbarton Blvd., Cleveland, Ohio

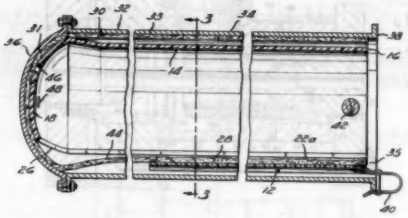
Filed Apr. 6, 1972, Ser. No. 241,707

Int. Cl. B28b *1/08*

U.S. Cl. 425—392 **8 Claims**

A method for inserting a flexible, oversized preform into an opening in a hollow mold is disclosed. The oversized preform is initially formed so as to have a configuration similar to that of the interior surfaces of the mold. The cross sectional size of the preform relative to the mold is temporarily reduced by

forming an inwardly projecting furrow in the preform so that the preform may be inserted into the mold. An assembly for



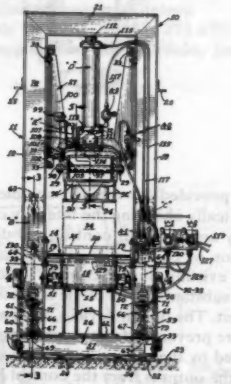
inserting the preform into the mold and reducing the cross sectional size of the preform as it is inserted into the mold is also disclosed.

3,781,156

AUTOMATIC CONCRETE FORMING MACHINE FOR PRODUCING HIGH DENSITY PRODUCTS

Leon E. Moore, 1240 S. 31st Ave., Phoenix, Ariz.

Filed Dec. 16, 1971, Ser. No. 208,589
Int. Cl. B28b *1/00*
U.S. Cl. 425—424 **5 Claims**



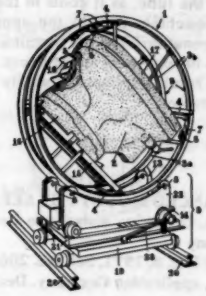
A machine capable of producing various shaped high density concrete products automatically when its associated mechanical components, including a pre-shaped mold box, insertable and retractable core plugs and tiltable double faced tamping device are caused to perform their specific functions in timed sequence.

3,781,157

MOLD MOUNTING FOR MAKING CERAMIC BATHROOM PIECES

Robert Maringer, and Claude Cordelle, both of La Ferte Gaucher, France, assignors to Villeroy & Boch S.A., Gaucher, France

Filed July 8, 1971, Ser. No. 160,719
Claims priority, application France, July 9, 1970, 7025501
Int. Cl. B28b *1/28*
U.S. Cl. 425—435 **1 Claim**



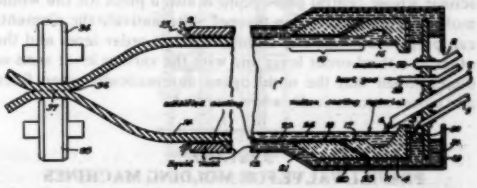
The mold mounting according to this invention is intended for molds in the mass, mechanized production of sanitary pieces such as basins, bidets, toilets and the like of ceramic material, and permits a perfect positioning of the various mold portions and an easy handling of the mold in the desired positions corresponding to the slip casting, slip draining, mold piston stripping and piece stripping operations.

3,781,158

CONTINUOUS CENTRIFUGAL TUBE CASTING APPARATUS USING A LIQUID MOLD

George R. Leghorn, 1423 Washington Ave., Apt. 1, Santa Monica, Calif.

Continuation-in-part of Ser. No. 768,983, Oct. 21, 1968, Pat. No. 3,616,842, which is a continuation-in-part of Ser. No. 538,506, Feb. 11, 1966, Pat. No. 3,445,922. This application Oct. 28, 1971, Ser. No. 193,476
Int. Cl. B22d *11/02*
U.S. Cl. 425—435 **32 Claims**



A molten castable substance (as metals, glass, plastic, etc.) is continuously centrifugally cast to tube on a centrifuged lining of a heavier liquid mold material (examples of which are lead, tin, and Wood's metal). The molten substance is con-

tinuously introduced into the starting end of the centrifugal casting machine and forms a molten, axially moving, cylinder on the liquid lining. The substantially solidified tube floats out of the bore at the opposite end of the casting machine on a lining of the liquid mold material and without contacting the solid portions of the machine's exit orifice. The unrestricted floating of the tube out of the exit orifice is accomplished by decreasing the diameter of the tube in its molten state by applying a pressure differential between the liquid mold material and the gas internal to the tube being cast. The pressure differential is brought about by various methods as disclosed in the specification. Prior art methods for the continuous centrifugal casting of tube on a liquid mold lining depend on thermal shrinkage of the tube, as it cools in the mold, to permit egress from the machine. Due to the applied pressure differential, such thermal shrinkage to permit unrestricted exit of the tube does not have to be a requirement of the present invention and, as a result, product variability and casting rates can be greatly increased.

3,781,159

COUNTERBALANCED MOUNT FOR SEPARABLE MOLD

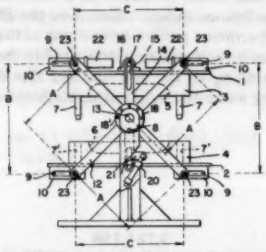
Rolf Lidl, Munich, Germany, assignor to Krauss-Maffei A.G., Munich, Germany

Filed Dec. 8, 1971, Ser. No. 206,005

Claims priority, application Germany, Dec. 9, 1970, P 20 60 478.8

Int. Cl. B29c *3/02*

U.S. Cl. 425—450 **7 Claims**



A mount for a separable mold has a pair of elements each carrying one mold member and displaceable towards and away from each other. A lever arrangement including at least one rigid link is provided between the two elements so that on displacement of one of the elements in one direction the other is displaced in the opposite direction. With one element arranged above the other its weight plus that of its mold member counterbalances that of the other element and its mold member so that the only force that need be exerted to open the mold is that necessary to overcome friction and inertia. The lever linkage can be a pair of lever arms arranged as a scissor whose central pivot point is also a pivot for the whole mold to allow positioning thereof. Alternatively the elements can be pivoted with one acting as a first-order lever and the other as a third-order lever and with the various lever arms so dimensioned that the mold opens automatically when filled and closes automatically when emptied.

3,781,160

PREFILL VALVE FOR MOLDING MACHINES

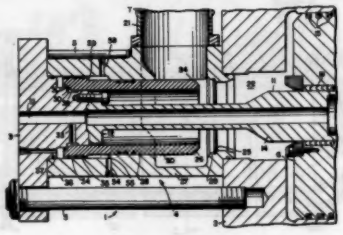
Vincent J. Mankowsky, Westchester, and Clarence J. Ceroke, Homewood, both of Ill., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Feb. 2, 1971, Ser. No. 111,929

Int. Cl. B29h *5/24*

U.S. Cl. 425—450 **8 Claims**

A prefill valve assembly for a hydraulically actuated molding machine, including a poppet shiftable axially within a valve cylinder between open and closed positions, wherein fluid pressure from the main hydraulic circuit is used to move the poppet to closed position rapidly, thereby reducing the overall cycle time of the machine.



3,781,161

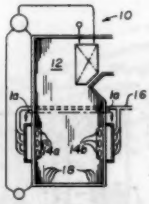
CONTROL LOGIC TEST CIRCUIT

Jack Ascher Schuss, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 3, 1972, Ser. No. 214,877

Int. Cl. F23n *5/24*

U.S. Cl. 431—16 **11 Claims**



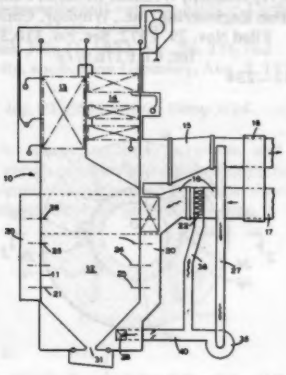
Means are provided for rapidly, completely, and substantially automatically checking the integrity of the logic and related circuitry employed to control and direct the initiation and termination of combustion at elevations of burners in a furnace. The existing burner control logic is utilized in the generation of substantially all of the input signals to remaining logic under test. The driven devices, such as burner guns, fuel valves, etc., are prevented from responding to their command signals supplied by the control logic. These command signals appearing at the outputs from the control logic system are indicative of proper operation of the logic required to produce them. The feedbacks to the control logic from the sensing devices associated with the driven devices are operative to indicate the fact that the disabled driven devices have not responded correctly to input commands during startup and to effect the necessary commands resulting in a shutdown sequence of the control logic. Means are provided for simulating the two or three signals required for proper sequential operation of the logic which fail to appear when the existing logic is operated in a test mode.

3,781,162

REDUCING NOX FORMATION BY COMBUSTION

Alexander H. Rudd, Akron; John H. Kidwell, Alliance, and Thomas J. Murray, Wadsworth, all of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 24, 1972, Ser. No. 237,850
Int. Cl. F23l 7/00
U.S. Cl. 431—115 8 Claims



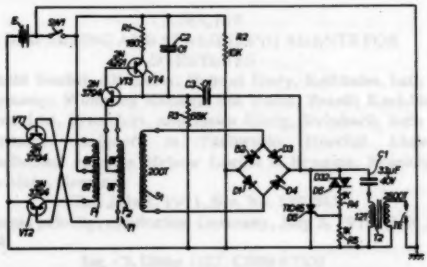
Apparatus for mixing recirculated flue gases with combustion air delivered to a furnace to reduce the formation of NO_x caused by the combustion of fuel. The recirculated gas is mixed with combustion air prior to delivery of the mixture to the furnace so that the mixture is substantially uniform when delivered to the combustion chamber.

3,781,163

LIGHTER WITH A CAPACITY DISCHARGE IGNITION SYSTEM AND MEANS FOR PREVENTING AUTOMATIC RECHARGING OF SAID CAPACITOR

Christopher William Ovens, Bracknell, England, assignor to Dunhill Lighters Limited, London, England

Filed July 14, 1972, Ser. No. 271,670
Claims priority, application Great Britain, June 7, 1972, 26,546/72
Int. Cl. F23q 3/01
U.S. Cl. 431—266 8 Claims



A smoker's lighter having a capacitor discharge electric ignition in which the recharging of the capacitor is prevented by means of a two transistor semiconductor switch. Reactuation of a manual ignition switch is necessary before the capacitor can be recharged. Automatic discharge of the capacitor is achieved by use of a trigger diode controlling a thyristor.

3,781,164

ANTI-SPILL CONTAINER

Dennis McCaffery, 551 Silver Lake Rd., New Brighton, Minn.

Filed Sept. 25, 1972, Ser. No. 291,963
Int. Cl. F23d 3/16
U.S. Cl. 431—291 4 Claims

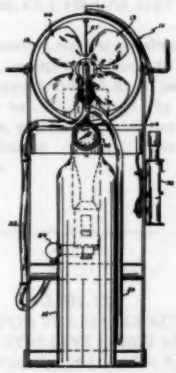
An anti-spill container for candles of the type wholly contained within the container is shown including a tubular body having a closed end and an open end. An inwardly directed tubular flange extends from the open end in a direction axially into the tubular container to define an annular recess which opens toward the closed end of the tubular body for collection of melted material from a lighted candle when the container is turned on its side.

3,781,165

FORCED AIR HEATER

David B. Wilkinson, 1723 Fernmont Dr., New Carlisle, Ohio

Filed Feb. 1, 1973, Ser. No. 328,823
Int. Cl. F23l 9/04
U.S. Cl. 432—62 7 Claims



A forced air heater having a pair of fuel burners supplying heat to a plenum chamber with a fan for providing a flow of air through the plenum chamber. Gaseous fuel supplied to the burners from a high pressure fuel containers drives a pneumatic motor which in turn drives the fan. The fuel leaving the motor output ports is supplied to the burners.

3,781,166

INDUSTRIAL FURNACE

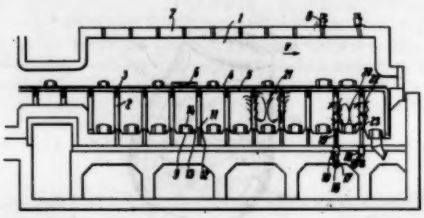
Eckard Bunzel, Neuss; Robert Spessert, Bergisch-Gladbach; Karl Rieskamp, Mulheim/Ruhr, and Willi Hildebrand, Dinslaken-Hiesfeld, all of Germany, assignors to OFU Ofenbau-Union GmbH, Duesseldorf, Germany

Filed Aug. 13, 1971, Ser. No. 171,675

Claims priority, application Germany, Aug. 17, 1970, P 20 40 766.3

Int. Cl. F27b 9/14

U.S. Cl. 432—126 9 Claims



An industrial furnace for heating metal plate and the like with flames directed at the horizontally disposed plate from above and below by suitably mounted jets. The lower jets are raised above the furnace floor and when operated in a turned-down or low heat output mode discharge the fuel gas and/or flame at a speed greater than the free-fall speed of scale and the like dropping from the plates to prevent a clogging of the burners. The floor burners are further provided with vertically extending gas discharge pipes which terminate in scale collection containers so that scale dropping into the burners when the burners are turned off falls through the operative burner portions for collection and subsequent removal without obstructing the burner.

3,781,167

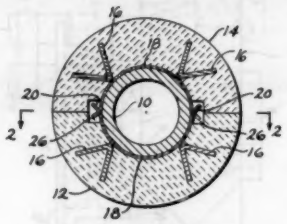
NO-WELD REFRACTORY COVERING FOR WATER COOLED PIPES

George Harvey Ahonen, Welland, Ontario, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 29, 1972, Ser. No. 310,312

Int. Cl. F27b 9/14

U.S. Cl. 432—234 6 Claims



An insulating jacket for water cooled pipes which can be quickly and easily installed.

CHEMICAL

3,781,168
PROCESS FOR PREPARING NAVY-BLUE AND GREY 1:2 CHROMIUM AND COBALT COMPLEX AZO-DYESTUFF MIXTURES FOR NATURAL AND SYNTHETIC POLYAMIDE AND POLYURETHANE FIBRES

Fritz Meininger, Frankfurt am Main, and Hermann Fuchs, Kelkheim/Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

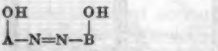
Filed July 31, 1972, Ser. No. 276,762

Claims priority, application Germany, Aug. 2, 1971, P 21 38 525.1

Int. Cl. C09b *45/48;* **D06p** *3/24*

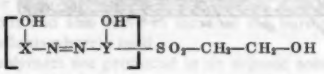
U.S. Cl. 8—26 **8 Claims**

A process for preparing new navy-blue and grey 1:2-chromium and cobalt complex azo dyestuff mixtures in which, in a single-pot-process, mixture of two water-insoluble o,o′-dihydroxy azo dyestuffs of the general formulae



(1)

and



(2)

wherein A and X are radicals of diazo components of the benzene series, which may contain non-ionic substituents, B and Y are radicals of coupling components of the naphthalene series which may contain non-ionic substituents, whereby the portion of the dyestuff (2) containing the β-hydroxyethyl sulfonyl group amounts to a maximum of 50 mol-percent, on the condition that the gram atom ratio of chromium to cobalt amounts to 5:1 to 20:1, are chromated and subsequently cobaltated, as well as the dyestuff mixtures obtained by this process which have a very good affinity to natural or synthetic fibres containing nitrogen with very good fastnesses to ligt and to wetting of their dyeings. They also show very good migration properties in the dyeing of the wool, polyamide and polyurethane fibres, so that dyeings having a considerably better levelness are obtained.

They, furthermore, can be more easily wetted and dispersed.

3,781,169
DISPERSING AND STABILIZING AGENTS FOR DYESTUFFS

Reinhold Deubel, Altenhain; Helmut Diery, Kelkheim, both of Germany; Wolfgang Klinner, Sao Paolo, Brazil; Karl-Hermann List, Frankfurt, and Heinz Uhrig, Steinbach, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed July 1, 1971, Ser. No. 159,065

Claims priority, application Germany, July 3, 1970, P 20 32 926.4

Int. Cl. D06p *1/22;* **C09b** *67/00*

U.S. Cl. 8—34 **2 Claims**

Dispersions of pigments, disperse- or vat-dyestuffs, wherein the dispersing agent is formed either by co-condensation of a phenolic component, formaldehyde and an alkali metal sulfite or of a sulfonated phenolic component and formaldehyde. These dispersions are characterized in that the dispersing agent used shows an improved dispersing effect. Furthermore, they can also be used when being neutralized for the dispersing alkali sensitive dyestuffs and they show no tendency to soil the fabrics so that also clean shades may be dyed.

3,781,170
LIGHTWEIGHT METAL COMPOSITE MATERIAL AND PROCESS FOR PRODUCING SAME

Masaaki Nakao, Urawa; Zenya Shiiki, and Yasuo Amagi, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 15, 1971, Ser. No. 165,780

Claims priority, application Japan, July 17, 1971, 46/62114; Aug. 10, 1971, 46/69218

Int. Cl. B22f *7/00*

U.S. Cl. 29—182.5 **9 Claims**

A lightweight metal composite material having hollow microspheres homogeneously dispersed in a light metal selected from the group consisting of aluminum, aluminum-base alloys and magnesium-base alloys. The hollow microspheres are composed of a material which is capable of withstanding the sintering temperature of the light metal, for example, a carbonaceous material such as carbon or graphite, a ceramic such as hard glass, a natural glass or silica or a metal such as copper, nickel or iron. The surface of the granular hollow microparticles are coated with the light metal, and sintered during or after a pressure shaping treatment. Alternately the mixture may further be mixed with a thermocurable binder.

3,781,171
ADDITIVE COMPOSITION FOR THE COMBUSTION AIR IN INTERNAL COMBUSTION ENGINES

Gino Maccaferri, Via Castiglione 26, Bologna, Italy

Filed Sept. 24, 1971, Ser. No. 183,677

Int. Cl. C10l *5/10, 5/40*

U.S. Cl. 44—1 R **4 Claims**

An additive composition for the combustion air in internal combustion engines, comprising from 40 to 80 percent by weight of an inert support, from 5 to 10 percent by weight of diphenyl, from 5 to 10 percent by weight of hexamethylenetetramine, and from 5 to 40 percent by weight of a binding agent chosen from either camphor or paradichlorobenzene.

3,781,172
PROCESS FOR THE MANUFACTURE OF MICROCRYSTALLINE FUSED ABRASIVES

Edgar A. Pett, 410 Main St., and Gordon Kinney, 364 Church St., both of Chippawa, Ontario, Canada

Continuation-in-part of Ser. No. 720,082, April 10, 1968, abandoned. This application Dec. 14, 1970, Ser. No. 98,014

Int. Cl. C09c *1/68*

U.S. Cl. 51—309 **6 Claims**

A method of manufacturing fused microcrystalline abrasives which comprises pouring a molten abrasive composition over relatively cold lumps of abrasive material of essentially the same composition and of approximately the same degree

of microcrystallinity as is desired in the final product. The poured melt freezes very rapidly in the interstices formed by said lumps, and at such a rate that the frozen melt possesses such a high degree of microcrystallinity that the resultant numerical average crystal size is less than 50 microns.

3,781,173

METHOD FOR PROVIDING METALLIC CARBIDE COATINGS ON GRAPHITE

John M. Napier, 113 Dartmouth Cir., and Anthony J. Caputo, 112 Caldwell Dr., both of Oak Ridge, Tenn.

Filed Jan. 12, 1971, Ser. No. 116,703
Int. Cl. C23c *11/08, 13/04*
U.S. Cl. 117—95 **1 Claim**

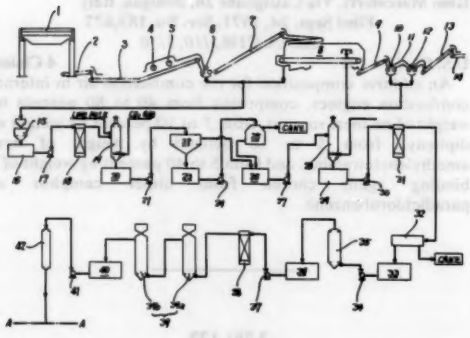
Metallic or nonmetallic carbide coatings of substantially uniform thickness are provided on internal surfaces of elongated bores within a graphite substrate by vapor deposition. The coating process is achieved by the thermal decomposition of a selected halide and the inter-reaction with a hydrocarbon gas at temperatures of 900°–1200°C. at atmospheric pressure. A temperature gradient along the length of the bore is used to control the coating deposition rate for providing a carbide coating of substantially uniform thickness.

3,781,174

CONTINUOUS PROCESS FOR PRODUCING REFINED SUGAR

Yoshiaki Nishijima, and Kazutaka Adachi, both of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co., Ltd., Osaka, Japan

Filed Oct. 13, 1971, Ser. No. 188,851
Claims priority, application Japan, Oct. 16, 1970, 45/90153
Int. Cl. C13d *3/06, 3/14, 3/18*
U.S. Cl. 127—46 A **8 Claims**



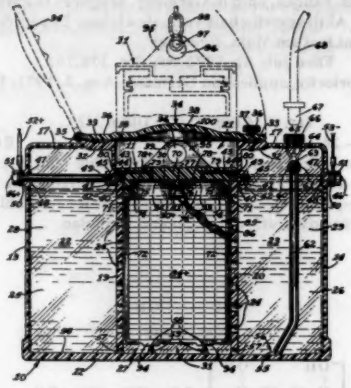
A continuous process for producing refined sugar from juice extracted from sugarcane or other raw material comprises removing part of the impurities and part of the coloring matter in the juice by the use of a continuous carbonation process, decolorizing the juice by the use of granular active carbon, further removing the impurities and coloring matter remaining in the juice by using a combination of ion-exchange resin and ion-exchange membrane electrodialysis, concentrating the purified juice, and crystallizing the concentrated juice to form refined sugar.

3,781,175

STORAGE BATTERY WITH EXCHANGEABLE ELEMENTS

Lewis R. Kinsey, 108 S. 25th St., Phoenix, Ariz.

Filed Feb. 18, 1971, Ser. No. 116,400
Int. Cl. H01m *35/00*
U.S. Cl. 136—7 **4 Claims**



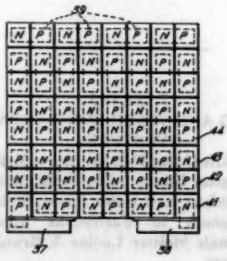
A rebuildable, rechargeable wet cell storage type battery employing a novel replaceable modular plate structure.

3,781,176

THERMOELECTRIC UNITS

Alan William Penn, Reading, and Frank Beighbour, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 25, 1971, Ser. No. 109,486
Claims priority, application Great Britain, Jan. 30, 1970, 4,729/70
Int. Cl. H01v *1/32*
U.S. Cl. 136—212 **7 Claims**



To provide for connection of electrical leads a metal strip is secured by adhesive to the side of a thermoelectric unit comprising an assembly of thermoelectric elements. Insulating material is interposed between the metal strip and the unit. An end face of the metal strip is formed flush with the end faces of the thermoelectric elements. An electrically conductive bridge is formed from the end face of the metal strip to an appropriate end face of a thermoelectric unit.

3,781,177

ISOSTEARIC ACID COATED, NON-DUSTING ALUMINUM PARTICLES

Thomas J. Kondis, Pittsburgh, and Rolf Rolles, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 249,112, May 1, 1972, abandoned. This application Apr. 26, 1973, Ser. No. 354,801

Int. Cl. C06b *19/02*

U.S. Cl. 149—6 **8 Claims**

Aluminum powder coated with isostearic acid exhibits substantially no dusting during handling thereby enhancing safety and environmental aspects.

3,781,178

PROPELLANT COMPOSITION WITH A HYDROXY-TERMINATED COPOLYMER-BINDER-CATALYST OF BUTADIENE AND ACRYLATE

Mart G. Baldwin, Newtown, Pa., and Samuel F. Reed, Jr., Huntsville, Ala., assignors to Rohm and Haas Company

Division of Ser. No. 849,255, July 31, 1969

Filed May 13, 1971, Ser. No. 143,274

Int. Cl. C06b *11/00*

U.S. Cl. 149—19 **2 Claims**

The copolymers of carboranyl methyl acrylate and butadiene and pertinent solid propellant formulations are disclosed. The copolymers serve as a binder for solid propellant compositions and also serve to increase the burning rate of solid propellants wherein used.

The copolymers are produced in an organic solvent when polymerization is initiated by an azo type initiator selected from the initiators consisting of azo-bis-(2-methyl-5-hydroxy-valeronitrile), azo-bis-(hydroxyethyl-2-methyl propionate), and azo-bis-(2-methyl-3-hydroxypropionitrile).

3,781,179

COMPOSITIE PROPELLANTS WITH A DIFUNCTIONAL BALLISTIC MODIFIER CURING AGENT

Chester W. Huskins, 623 Owens Dr. Southeast, Huntsville, Ala., and Albert J. Thomas, Jr., 1721-B Reap Dr., Fayetteville, Ark.

Division of Ser. No. 129,196, March 29, 1971. This application Aug. 4, 1972, Ser. No. 278,494

Int. Cl. C06d *5/06*

U.S. Cl. 149—19 **3 Claims**

Disclosed is the liquid, olefinic ferrocene derivative derived from vinyl magnesium chloride and diacetyl ferrocene, which derivative can be co-cured with hydroxy terminated polybutadiene polymers (HTPB) to yield a polymeric binder system for propellants having a chemically bound ballistic modifier as an integral part of the binder. The ferrocene derivative is a difunctional compound having two hydroxyl groups per molecule. Curing of the HTPB and the dihydroxy-ferrocene compound is accomplished by diisocyanates which is added in sufficient quantity so that all the hydroxyl groups of the HTPB and the ferrocene derivative are reacted.

3,781,180

AMMONIUM NITRATE-FUEL OIL COMPOSITION CONTAINING AMMONIUM NITRATE PRILLS OF DIFFERENT POROSITY, HARDNESS, AND DENSITY

Paul Stanley Harrison, Flemington, and Gwyn Harries, Elsternwick, Victoria, both of Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia

Filed May 4, 1971, Ser. No. 140,106

Claims priority, application Australia, May 18, 1970, 1227

Int. Cl. C06b *1/04*

U.S. Cl. 149—21 **9 Claims**

Ammonium nitrate — fuel oil compositions comprising ammonium nitrate prills and fuel oil wherein between 15 and 90 percent w/w of said prills have an oil porosity of more than 5 g of oil per 100 g of ammonium nitrate and between 10 and 85 percent w/w of said prills have an oil porosity of less than 2 g of oil per 100 g of ammonium nitrate.

3,781,181

PROCESS FOR THE MANUFACTURE OF A CARPET WITH PILE THAT IS VERTICALLY LINED UP IN ROWS AND WITH RIBBON-SHAPED INTERLAYERS WHICH RUN THROUGH PART OF THE HEIGHT OF THE PILE AND ARE ATTACHED TO THE ROWS OF PILE

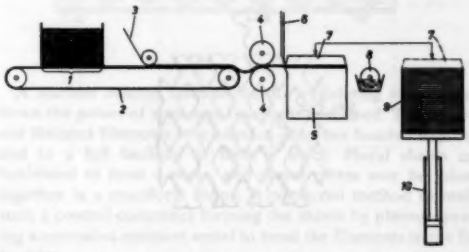
Ruedi Reinhard, Gruger 4917, Melchnau, Switzerland

Filed May 18, 1970, Ser. No. 38,308

Claims priority, application Switzerland, May 21, 1969, 7759/69

Int. Cl. B32b *31/12*

U.S. Cl. 156—72 **3 Claims**



A process for the manufacture of a carpet with pile that is vertically lined up in rows, and with ribbon-shaped interlayers which run through part of the height of the pile and are attached to the rows of pile.

3,781,182

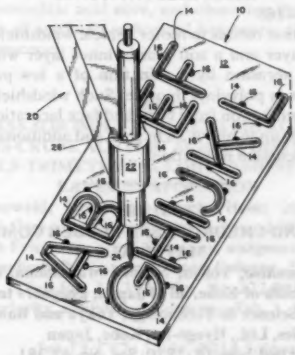
MASTER TEMPLATE FOR ENGRAVING

Jerome Friedman, No. 19 Glenada, Roslyn, N.Y.

Filed Aug. 10, 1971, Ser. No. 170,602

Int. Cl. B44f *1/00*; B32b *31/18*; G09f *7/10*; B23d *5/04*

U.S. Cl. 161—5 **6 Claims**



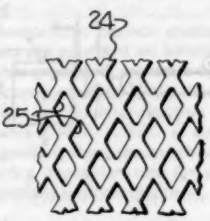
A master template and method of forming same, the template comprising a mounting plate, and independent characters provided on the mounting plate, the independent characters each including opposite surfaces, one of which surfaces is concealed and extends in flush relation along said mounting plate and the other of which surfaces is exposed relative to said mounting plate. The independent characters may be of three-dimensional, two-dimensional, or of sunk nature and each have substantially identical raised or recessed extents transversely of the mounting plate. A solvent is utilized for connecting the characters to the mounting plate such that the concealed portion of each of the characters substantially

remains in generally flush relation with the mounting plate and the transverse extent of each of the characters remains substantially identical relative to one another on the mounting plate.

3,781,183
NET-LIKE THERMOPLASTIC MATERIAL AND PRODUCTS

Martin Doll, Patterson, N.C., assignor to Cellu Products Company, Patterson, N.C.

Division of Ser. No. 837,162, June 27, 1969, Pat. No. 3,642,967. This application July 26, 1971, Ser. No. 166,102
Int. Cl. B32b *3/10*
U.S. Cl. 161—109 **5 Claims**



Net-like thermoplastic materials and products formed therefrom use properties of thermoplastic materials to provide improved packaging material such as wrapping materials and receptacles, through slitting and opening of sheet material and heat setting of the material in the opened condition and in any desired configuration.

3,781,184
SAFE BI-MODAL WINDSHIELDS

Joseph J. Domicone, and Theodore R. Kozlowski, both of Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 24, 1971, Ser. No. 146,176
Int. Cl. B32b *17/10, 27/08*
U.S. Cl. 161—165 **1 Claim**

This invention relates to motor vehicle windshields having a glass outer layer and a soft plastic inner layer which is protected from abrasion by a thin film of a low-permeability polymer such as polyvinyl fluoride. Such windshields provide nearly ideal protection from head and face lacerations in collisions at speeds up to about 36 m.p.h., and additionally provide excellent concussion protection.

3,781,185
METAL AND CHLOROPRENE RUBBER COMPOSITE MATERIAL

Hideaki Takamatsu, Tokyo; Noboru Murashima, and Koichi Nishihira, both of Kobe, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo and Bando Chemical Industries, Ltd., Hyogo-ku, Kobe, Japan

Filed June 18, 1970, Ser. No. 47,381
Claims priority, application Japan, June 20, 1969, 44/48411; June 20, 1969, 44/48412; June 20, 1969, 44/48413
Int. Cl. B32b *15/04*
U.S. Cl. 161—217 **4 Claims**

A vulcanizing agent and other component chemicals necessary for rubber formulation are added to a coprecipitate containing chloroprene rubber and barium silicate, and the rubber compound so obtained is subjected to blending. Further, the rubber compound is overlaid with a metal sheet and valcanized under application of heat and pressure, whereby a metal and chloroprene rubber composite material is produced.

3,781,186
LAMINATES OF STYRENE POLYMERS AND POLYPHENYLENE OXIDE

Karl Stange, Hambach; Helmut Jenne, Schriesheim, and Ulrich Koenig, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

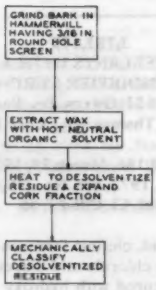
Filed Mar. 27, 1972, Ser. No. 238,639
Int. Cl. B32b *27/08*; C08f *31/00*
U.S. Cl. 161—253 **5 Claims**

Laminates of polyphenylene oxide as layer A and a styrene polymer as layer B. Layer A contains more than 20 percent of polyphenylene oxide; layer B is a styrene polymer containing more than 40 percent of polymerized units of styrene. The laminates may be used in the manufacture of film or sheeting, e.g. for packaging purposes.

3,781,187
METHOD OF SEPARATING BARK COMPONENTS

Frank S. Trocino, Eugene, Oreg., assignor to Bohemia Lumber Company, Incorporated, Eugene, Oreg.

Filed Mar. 8, 1972, Ser. No. 232,737
Int. Cl. C11b *11/00*; D01c *1/00*
U.S. Cl. 162—93 **10 Claims**


GRIND BARK IN HAMMERMILL HAVING 3/16 IN. ROUND HOLE SCREEN
EXTRACT WAX WITH HOT NEUTRAL ORGANIC SOLVENT
HEAT TO DESOLVENTIZE RESIDUE & EXPAND CORK FRACTION
MECHANICALLY CLASSIFY DESOLVENTIZED RESIDUE

Douglas Fir bark is extracted with a hot neutral organic solvent to separate the wax from the bark. Thereafter, the residue is heated to desolventize the same and expand the cork fraction substantially in size. Such facilitates efficient subsequent mechanical classification of the cork, bark fiber, and nonfibrous phloem fractions of the bark to a high degree of purity and quality.

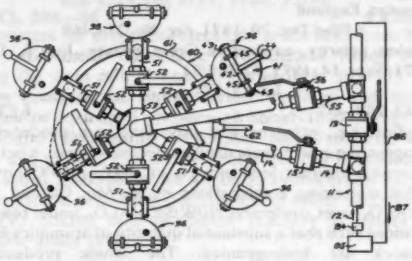
3,781,188
EXPERIMENTAL RESEARCH PULP DIGESTER ASSEMBLY

John M. Bagley, and John L. Keays, both of Vancouver, British Columbia, Canada, assignors to Ellett Copper and Brass Company Ltd., Vancouver, Canada

Continuation of Ser. No. 888,590, Dec. 29, 1969, abandoned. This application Feb. 22, 1972, Ser. No. 228,247
Int. Cl. D21c *7/12*
U.S. Cl. 162—233 **2 Claims**

Method of processing, digesting, or pulping samples of e.g. a body of wood chips under conditions reproducing experimental or production runs with precision. Samples are processed in sealed cannisters with heat supplied by liquid circulating

through each at a constant temperature, processing in any cannister is terminated at a required time within seconds, the contents are cooled, the cannister unsealed and contents tested to determine progress. Apparatus using the method has hot liquid supply to each cannister from a manifold through



conduits of equal length so that the temperature in each is the same, valves in conduits and in discharge conduits can be closed, selectively isolating any cannister. Water is introduced to flush and cool. Means are provided to alter the temperature of liquid supplied to a particular cannister.

3,781,189

SPENT NUCLEAR FUEL SHIPPING CASKS

Alvin H. Kasberg, Murrysville, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed July 7, 1971, Ser. No. 160,498

Int. Cl. G21c *19/00*; **G21f** *5/00, 1/08*

U.S. Cl. 176—28 **4 Claims**

UH_3-Ductile metal cermet is used as a radiation shield in a shipping cask for spent nuclear fuel rods.

3,781,190

GAS COOLED NUCLEAR REACTORS

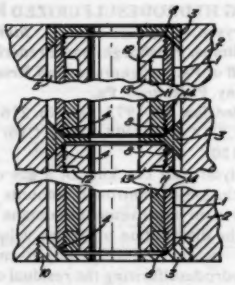
Allan Clarkson Rapier, Seascale, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 10, 1972, Ser. No. 233,445

Claims priority, application Great Britain, Mar. 22, 1971, 7,508/71

Int. Cl. G21c *5/06, 5/14, 3/16*

U.S. Cl. 176—59 **4 Claims**



Nuclear reactor wherein stacks of fuel elements are supported centrally within vertical channels of a graphite moderator by annular discs disposed at each end of each fuel element. The discs have inner and outer diameters to correspond with inner and outer diameters of the fuel elements and conical seats complementary to tapers on the ends of the fuel elements. The lowermost disc is secured to the wall of the channel whilst the remainder are free to slide. The construction maintains uniform coolant flow passages through and about the fuel elements and allows for irradiation growth of the fuel elements and graphite moderator.

3,781,191

NUCLEAR CONTROL ROD HAVING EMBEDDED FILAMENTS

Cecil R. Jones, Hamden, Conn., assignor to Transfer Systems Incorporated, New Haven, Conn.

Filed Feb. 22, 1972, Ser. No. 228,067

Int. Cl. G21c *7/10*

U.S. Cl. 176—86 R **8 Claims**

A nuclear reactor control rod for regulating or shutting-down the power of a nuclear reactor is described. The control rod features filaments of a neutron absorber bonded together and to a foil backing to form a sheet. Plural sheets are laminated to form a plate, and plural plates may be joined together in a cruciform shape. A preferred method to make such a control comprises forming the sheets by plasma-spraying a corrosion-resistant metal to bond the filaments to the foil backing.

3,781,192

TEST FOR HEMOLYTIC STREPTOCOCCI AND TEST MEDIA THEREFOR

Harrison F. Wood, 183 Livingston St., New Haven, and Sidney Bernstein, 49 Harbor View Ave., Milford, both of Conn.

Filed May 1, 1972, Ser. No. 248,816

Int. Cl. C12k *1/10*

U.S. Cl. 195—100 **8 Claims**

The presence of beta hemolytic streptococci in a test culture is rapidly ascertained by inoculating a solid nutrient medium such as blood agar with the test culture, wherein the medium contains a ribonucleic acid preparation consisting essentially of ribonucleic acid core, and observing the medium for appearance of markedly enhanced hemocytic characteristics of the streptococci.

3,781,193

PROCESS FOR ISOLATING ACRYLIC ACID FROM AQUEOUS CRUDE ACRYLIC ACID BY DISTILLATIONS WITH 3,3,5-TRIMETHYCYCLOHEXAMONE AND THIN LAYER EVAPORATION

Kurt Sennewald; Heinz Erpenbach; Heinz Handte, all of Cologne; Georg Kohl, Hurth-Burbach, and Winfried Lork, Erftstadt-Friesheim, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Jan. 31, 1972, Ser. No. 222,003

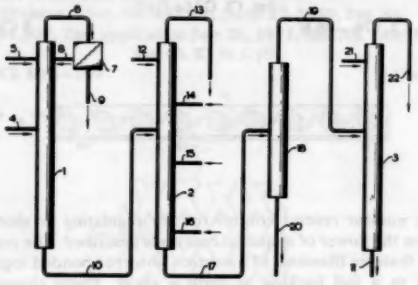
Claims priority, application Germany, Feb. 1, 1971, P 21 04 506.7

Int. Cl. C07c *57/04*; **B01d** *3/36*

U.S. Cl. 203—8 **13 Claims**

Acrylic acid and acetic acid are isolated from aqueous crude acrylic acid containing acrylic acid and acetic acid and contaminated with minor proportions of formaldehyde and higher boiling constituents, such as maleic acid and polymeric acrylic acid, by subjecting the aqueous crude acrylic acid to extractive azeotropic distillation in the presence of a distillation aid. More particularly the aqueous crude acrylic acid is distilled in a first distilling column in the presence of 3,3,5-trimethylcyclohexanone as the distillation aid under a pressure between 20 and 80 mm mercury; an azeotrope of 3,3,5-trimethylcyclohexanone and water and the bulk of the formaldehyde are removed near the head of the column and acrylic

acid, acetic acid and minor proportions of distilling aid, residual formaldehyde and higher boiling constituents are obtained in the column's base portion; the base product coming from the first distilling column is delivered to a second distilling column and distilled therein under a pressure between about 20 and 80 mm mercury while obtaining, as the distillation residue, acrylic acid free from acetic acid, distilling aid and higher boiling constituents; the distillation residue coming from the second distilling column is delivered to a thin



layer evaporator and the acrylic acid together with the distilling aid are evaporated therein under a pressure between 20 and 80 mm mercury so as to free the acrylic acid from the said higher boiling constituents; acrylic acid in vapor form escaping at the head of the thin layer evaporator and contaminated with distilling aid is introduced into a third distilling column and separation firstly into acrylic acid and secondly into distilling aid is effected therein under a pressure between about 20 and 60 mm mercury.

3,781,194

PROCESS FOR THE PHOTOCATALYTIC OXIDATION OF HYDROCARBONS INTO ALDEHYDES AND KETONES

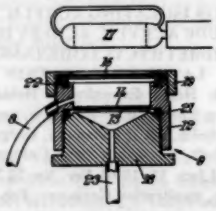
Francois Juillet; Stanislas Teichner, and Marc Formenti, all of Villeurbanne, France, assignors to Agence Nationale de Valorisation de la Recherche, Paris, France

Filed Sept. 15, 1970, Ser. No. 72,341

Claims priority, application France, Sept. 15, 1969, 6931280

Int. Cl. B01j *1/10*; C07c *3/24*

U.S. Cl. 204—162 R **10 Claims**



Process for the oxidation of gaseous hydrocarbons or hydrocarbons in the gaseous or vapour state, in heterogeneous phase, which comprises producing, at a temperature below 100°C, a circulation or continuous flow of a gaseous mixture or of gas and vapours containing the hydrocarbon to be oxidised and oxygen into contact with a catalyst subjected to ultra-violet radiation, this catalyst being constituted by a metal oxide containing or retaining by adsorption molecules of oxygen which are mobile under irradiation, such as titanium dioxide, the ultra-violet radiation being at least partly within the domain of wavelengths lower than the wave length of the radiation whose energy is that of the prohibited bandwidth of the oxide.

3,781,195

PROCESS FOR THE PRODUCTION OF GASEOUS OLEFINS FROM PETROLEUM DISTILLATE FEEDSTOCKS

Paul Trevor Davis, Feltham; Terence George Glover, Isleworth, and John Robert Jones, Walton-on-Thames, all of England, assignors to BP Chemicals International Limited, London, England

Filed Dec. 30, 1971, Ser. No. 214,468

Claims priority, application Great Britain, Jan. 6, 1971, 605/71; Sept. 14, 1971, 42,765/71

Int. Cl. C10g *37/00*

U.S. Cl. 208—57 **6 Claims**

Olefins, e.g., ethylene and propylene, are produced by hydrogenating a petroleum distillate feedstock, e.g., a petroleum vacuum distillate feedstock (b. pt. 300° – 650°C), over a catalyst containing combinations of Ni, Mo, Co and Won SiO_2/Al_2O_3 bases, preferably $Ni/W/SiO_2/Al_2O_3$, under reaction conditions such that a substantial quantity of aromatics in the feedstock are hydrogenated. The whole product of hydrogenation is then thermally cracked in the presence of steam, producing an increased yield of gaseous olefin products.

3,781,196

STABILIZING A HYDROCRACKED LUBE OIL BY SOLVENT EXTRACTION

Sheldon L. Thompson, Glen Mills, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 875,502, Nov. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 530,580, Feb. 28, 1966, abandoned. This application Sept. 1, 1972, Ser. No. 285,709

Int. Cl. C10g *13/02*

U.S. Cl. 208—96 **19 Claims**

Process of preparing lubricating oils of improved quality stability in color and sludge formation of oils hydrogenated at temperatures above 650° F. by serially extracting same subsequent to hydrogenation with a solvent having preferential solubility for aromatics.

3,781,197

PROCESS FOR CRACKING HYDROCARBONS CONTAINING HYDRODESULFURIZED RESIDUAL OIL

Millard C. Bryson, Conway; Joel D. McKinney, Indiana; Robert A. Titmus, Pittsburgh, and Frederick K. White, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 10, 1972, Ser. No. 216,428

Int. Cl. C10g *11/04, 37/00*; C10l *1/04*

U.S. Cl. 208—120 **19 Claims**

In fluid catalytic riser cracking of a gas oil with a zeolite catalyst the inclusion of controlled amounts of residual oil in the feed results in an improvement in octane value and/or improvement in the distribution of octane value of the gasoline product. The octane number improvement is further enhanced by hydrodesulfurizing the residual oil prior to charging to the FCC unit. However, residual oil is relatively difficult to vaporize and the extent of its vaporization will depend on the equilibrium flash vaporization temperature at the bottom or inlet of the riser. Therefore, the quantity of residual oil in the feed must be controlled in relation to the equilibrium temperature in order to, on the one hand, vaporize and crack a sufficient quantity of residual oil to obtain the octane improvement effect, while, on the other hand, keeping the quantity of residual oil which remains unvaporized below a specified level.

3,781,198
PROCESS FOR MAKING ELECTRODE GRADE COKE

Raymond Wynkoop, Gladwyne, and Edward M. Kohn, Philadelphia, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Feb. 2, 1972, Ser. No. 223,025
Int. Cl. C10g *9/14, 9/28, 23/02*
U.S. Cl. 208—86 **4 Claims**

A process for producing electrode grade coke from high sulfur and metal containing hydrocarbon resids comprising the steps of (1) heating the resid at 325–375° C. in the presence of finely divided sodium and under nitrogen or hydrogen pressure of about 1500 p.s.i.g. for 1–3 hours, (2) washing the sodium treated material with water and CO_2 at elevated temperature, (3) deasphalting the washed material by an aliphatic hydrocarbon extraction to yield a petroleum fraction low in sulfur and metals, and (4) coking said petroleum fraction to obtain an electrode grade coke.

3,781,199
CATALYTIC HYDROCRACKING OF AMMONIA CONTAINING FEEDSTOCKS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

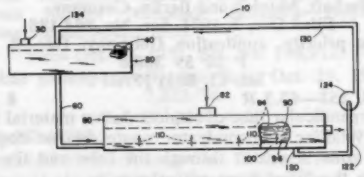
No Drawing. Filed Mar. 20, 1972, Ser. No. 236,185
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 **16 Claims**

Hydrocarbon feedstocks in admixture with ammonia, as for example the total effluent derived from the catalytic hydrofining of a nitrogen containing feedstock, are subjected to hydrocracking in the presence of a stabilized, ammonia-resistant Y zeolite catalyst. Stability to steam and ammonia is imparted to the zeolite base during conversion from its original sodium form to a decationized and/or hydrogen form by a novel sequence of: (1) partial exchange of ammonium ions for sodium ions, (2) steam calcination, (3) further ion exchange of ammonium ions for sodium ions, and (4) recalcining the twice-exchanged zeolite in intimate admixture with a finely divided, hydrous metal oxide such as alumina.

3,781,200
FLUOROCARBON AND OXYGEN-PROVIDING COMPOUND TREATMENT OF WASTE WATERS

Manuel Grant Hicks, 1927 S. 8th St., Omaha, Nebr. 68108

Continuation-in-part of abandoned application Ser. No. 139,986, May 3, 1971. This application Sept. 18, 1972, Ser. No. 290,159
Int. Cl. B01d *11/04*
U.S. Cl. 210—21 **5 Claims**

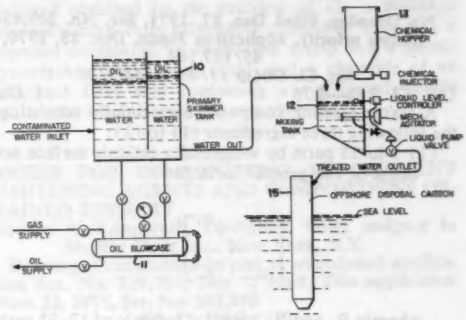


A process of using heavy Freon as a solvent for H_2O_2, ozone, oxygen or air for carrying these oxygen providers beneath a body of sewer water so that oxygen diffuses upwardly into the water from the Freon to control septic odors or to cause aerobes to thrive and so that material such as fat in the water is dissolved in the Freon to facilitate its extraction.

3,781,201
METHOD FOR SEPARATING OIL FROM A MIXTURE OF OIL AND WASTE WATER FROM AN OFFSHORE RIG

Charles J. Carmichael, 2278 Telestar St., Harvey, La. 70058, and Albert G. Franklin, 2712 Holiday Drive, New Orleans, La. 70114

Filed Jan. 24, 1972, Ser. No. 219,944
Int. Cl. B01d *15/00*
U.S. Cl. 210—27 **5 Claims**



The present disclosure is directed to separating oil from a mixture of oil and waste water on offshore rigs where the water cannot merely be allowed to wash overboard containing oil which pollutes the environment and endangers marine life. The mixture of oil and water is first passed through a primary skimmer tank where oil that quickly separates from water is skimmed off into a blow case and water from the bottom of the skimmer tank is fed to a mixing tank where gypsum and lime are added and the gypsum-oil and excess gypsum and other pollutants are mechanically separated from the water.

3,781,202
SPIN FINISH FOR POLYAMIDE YARN PROCESSED AT HIGH TEMPERATURE

Robert Moore Marshall, Chesterfield County, and Kimon Constantine Dardoufas, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 28, 1972, Ser. No. 221,828
Int. Cl. D06m *13/30*
U.S. Cl. 252—8.7 **4 Claims**

A spin finish composition for nylon feeder yarn to be processed at high temperature into carpet yarn, such as by steam jet texturing, comprising coconut oil, sulfonated natural petroleum product and other essential components results in improved processing and better quality yarn.

3,781,203
THICKENED ACID COMPOSITIONS AND METHODS FOR MAKING SAME

Robert P. Clark, Skanesteles, N.Y., and Milton Freifeld, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Original application May 27, 1968, Ser. No. 732,111, now abandoned. Divided and this application Mar. 17, 1971, Ser. No. 125,422
Int. Cl. C08f *29/30;* **E21b** *43/27*
U.S. Cl. 252—8.55 C **6 Claims**

A composition adapted for the thickening of aqueous acid compositions, such compositions so thickened, and a method for preparing such thickening compositions, such thickening compositions consisting essentially of the interaction product of (a) polyvinyl alcohol containing from 1 to 20% unsaponified 1 to 4 carbon atom fatty

acid ester groups with (b) an equimolar interpolymer of an α,β-unsaturated aliphatic dicarboxylic acid anhydride with an α-olefinic comonomer selected from the group consisting of alkyl vinyl ethers, vinyl esters, α-olefins, acrylic acids and acrylic acid esters, (a) and (b) being present in the molar ratio of 100:1 to 1:10.

3,781,204
TEXTILE TREATING COMPOSITION
Mamoru Katsumi, Toshio Sato, and Tadao Hara, Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan
No Drawing. Filed Dec. 17, 1971, Ser. No. 209,454
Claims priority, application Japan, Dec. 23, 1970, 45/117,164
Int. Cl. D06m *13/46*; B44d *5/06*
U.S. Cl. 252—8.75 **1 Claim**

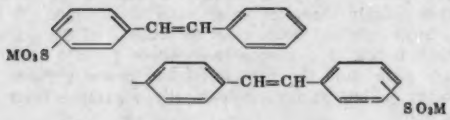
A textile treating composition essentially consisting of the following three ingredients (1) to (3):

(1) 1 to 10 parts by weight of a cationic surface active agent of the general formula:

wherein R_1 and R_2 are alkyl radicals of 12–22 carbon atoms, R_3 and R_4 are alkyl radicals of 1–4 carbon atoms and X^- is a halogen ion, $CH_3SO_4^-$ or

$$C_2H_5SO_4^-,$$

(2) 0.05 to 0.5 part by weight of an optical brightener of the general formula:



wherein M is an alkali metal or an ethanol amine, and

(3) 0.5 to 10 parts by weight of a cationic surface active agent which is characterized by that

(i) it has one or more of cationic nitrogen atoms in a molecule,

(ii) it has 1 to 3 polyoxyethylene groups attached on said cationic nitrogen atoms, each of the polyoxyethylene groups having a terminal hydroxy radical and having oxyethylene units of 1–14 moles, and

(iii) it has one or two of RCH_2^-, $RCONH(CH_2)_n^-$ or $RCOO(CH_2)_n^-$, in which R is an alkyl radical of 11–21 carbon atoms and *n* is an integer of 1 to 3, in a molecule.

3,781,205
COMPOSITE BEARINGS
James Cairns and Nicholas Walton, Cherry Hill, N.J., assignors to Garlock, Inc., Palmyra, N.Y.
No Drawing. Filed Feb. 2, 1970, Ser. No. 8,065
Int. Cl. C10m *7/34*
U.S. Cl. 252—12.6 **12 Claims**

A composite bearing comprising a backing member to which there is secured a dimensionally stable bearing surface layer comprising a solid lubricant selected from the group consisting of the sulfides, selenides, and tellurides of molybdenum, tungsten, and titanium, lead diiodide, boron nitride, carbon, graphite, and polytetrafluoroethylene and fibers of a material characterized by a heat distortion temperature exceeding that of polytetrafluoroethylene and selected from the class consisting of aromatic polyamides, carbon, graphite, aromatic polysulfones, aromatic polyimides and aromatic polyester-imides.

3,781,206
LUBRICANT COMPOSITIONS
Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
No Drawing. Filed Nov. 5, 1971, Ser. No. 196,203
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 R **6 Claims**

The antioxidant properties of lubricants are improved by adding thereto an antioxidant amount of an alkoxydiarylamine.

3,781,207
DEVELOPER MIXTURE FOR ELECTROSTATIC PRINTING
Richard F. Tamm, Elmhurst, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
No Drawing. Filed Dec. 18, 1968, Ser. No. 784,888
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 **1 Claim**

In an electrostatic printing process employing a developer mixture comprised of electrically conductive carrier particles and electrostatically attractable toner particles, the speed of printing is increased by incorporating in the developer mixture finely divided particles having a particle size of between about .007 and about 0.09 micron.

3,781,208
LIQUID DEVELOPERS CONTAINING AZO DYES
Yasuo Ueda, Kobe, Yasutoki Kamezawa and Tatsuo Aizawa, Osaka, and Toshimitu Ikeda, Himeji, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan
No Drawing. Filed Apr. 28, 1970, Ser. No. 32,733
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 **10 Claims**

A liquid developer comprising a dispersion of a dye or pigment having a long chain alkyl group in the molecule structure in a liquid hydrocarbon. The liquid developer for electrophotography is excellent in dispersibility of the image-forming dye or pigment particles, uniformity in charge polarity, storage stability, distinct-image forming ability and image-fixing property, and such liquid developer can be prepared without aid of conventional modifiers such as control agents, dispersing agents and fixing agents.

3,781,209
METHOD OF PRODUCING HOMOGENEOUS RODS OF SEMICONDUCTOR MATERIAL
Konrad Reuschel, Vaterstetten, Wolfgang Dietze and Alfred Muhlbauer, Munich, and Herbert Sandmann, Vaterstetten, Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Germany
Filed Dec. 2, 1971, Ser. No. 204,188
Claims priority, application Germany, Dec. 2, 1970, P 20 59 360.6
Int. Cl. B01j *17/08*
U.S. Cl. 252—62.3 R **8 Claims**

A perpendicular tube of semiconductor material is filled with crystalline semiconductor waste and/or dopant. A molten zone is guided through the tube and the filling, whereby the filling fuses with the tube.

3,781,210
MAGNETIC COATING COMPOSITION
Virgil Allan Lohoff, Santa Clara, Calif., assignor to Memorex Corporation, Santa Clara, Calif.
No Drawing. Filed May 16, 1972, Ser. No. 253,832
Int. Cl. H01l *1/26*
U.S. Cl. 252—62.54 **2 Claims**

A fluid, heat curable thermosetting magnetic coating composition in which magnetic particles are dispersed in

a solution of five components which upon evaporation of the solvent and heating form a durable resin matrix having the magnetic particles dispersed in it. The five components in solution are an epoxy resin having a molecular weight of about 400–4000 per epoxy group, an amine aldehyde condensation product containing secondary amine groups, a polyamine containing primary amine groups, a polyvinyl acetal resin, and a silanol modified silicone resin.

3,781,211

MAGNETIC COATING COMPOSITION

Virgil Allan Lohoff, Santa Clara, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

No Drawing. Filed Aug. 10, 1972, Ser. No. 279,517

Int. Cl. H01f *1/26*

U.S. Cl. 252—62.54 **4 Claims**

A fluid, heat curable thermosetting magnetic coating composition consisting of magnetic particles dispersed in a solution of three components which upon evaporation of the solvent and heating form a durable resin matrix having the magnetic particles dispersed in it. The three components in solution are an epoxy resin having a molecular weight of about 400–4000 per epoxy group, a polyamine containing at least one primary amine group and a polyvinyl acetal resin. The solvent must be capable of dissolving the three components, must be inert to them at temperatures up to solvent boiling point and must consist to the extent of at least 33 volume percent of diethylene glycol dimethyl ether.

3,781,212

AEROSOL ENZYME DETERGENTS STABILIZED WITH CARBON DIOXIDE

Winston B. Smillie, Santa Ana, Calif., assignor to Townsend and Townsend, San Francisco, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 56,638, July 20, 1970. This application Oct. 27, 1972, Ser. No. 301,548

Int. Cl. C11d *7/42*

U.S. Cl. 252—89 **6 Claims**

Stable liquid or semi-liquid detergent compositions are provided, preferably in the form of foamy aerosols, containing hydrolytic enzymes stabilized by colloidal silica and/or dissolved carbon dioxide.

3,781,213

METHOD FOR THE PREPARATION OF HOMOGENEOUS METERABLE PASTES AND SUSPENSIONS OF PHTHALIC ACIDS AND GLYCOLS, FOR FEEDING PLANTS, MORE PARTICULARLY CONTINUOUS ESTERIFICATION PLANTS

Francesco Siclari, Barlassina, and Franco Magnoni and Battista Morandi, Milan, Italy, assignors to Snia Viscosa Società Nationale Industria Applicazoni Viscosa S.p.A., Milan, Italy

Filed Oct. 20, 1971, Ser. No. 190,912

Claims priority, application Italy, Oct. 21, 1970, 7,223/70

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 **10 Claims**

A method and an apparatus are disclosed for preparing phthalic acid-glycol mixtures for esterification. A problem which is frequently encountered in preparing such paste is the retention of the homogeneousness of their composition, especially in continuous esterification installations. Contrary to widely accepted and well established technical views, it has been discovered that, by keeping the mixtures or pastes at a comparatively low temperature, the preferred range being between 35° C. and 20° C., the problem indicated above, and others connected therewith, are happily solved and the undesirable formation of lumps and incrustations is effectively prevented.

3,781,214

PHOTOPOLYMERIZABLE PRINTING INK

Yuhei Nemoto, Tokyo, and Shiro Takahashi, Omiya, Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan

No Drawing. Filed Nov. 23, 1971, Ser. No. 201,497

Claims priority, application Japan, Nov. 25, 1970, 45/103,301

Int. Cl. C09d *11/10*

U.S. Cl. 260—22 TN **3 Claims**

Photopolymerizable printing ink which is cured under irradiation of ultraviolet rays and is characterized in that the same comprises a photopolymerizable, unsaturated compound obtained by the reaction of (I) a hydroxyl group-containing, fatty oil-soluble compound with (II) a compound containing an isocyanate group and a photopolymerizable, unsaturated bond, and a glyceride of an unsaturated fatty acid containing a conjugated double bond, as the essential vehicle components.

3,781,215

PROCESS FOR COMMINUTING FLUORESCENT WHITENING AGENTS AND COMPOSITIONS OBTAINED THEREBY

Theodore A. Langstroth, Cincinnati, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 839,703, July 7, 1969. This application Nov. 22, 1971, Ser. No. 201,198

Int. Cl. D06l *3/12*

U.S. Cl. 252—301.3 W **4 Claims**

A process for comminuting relatively large crystals of solid fluorescent whitening agents to a particle size having a diameter no greater than 5 microns which comprises grinding a water-wet presscake of said agent with at least one molecular equivalent of anhydrous sodium sulfate for each ten molecular equivalents of water present in the presscake and the fluorescent whitening compositions obtained thereby.

3,781,216

PROCESS FOR THE PRODUCTION OF OXIDE AND CARBIDE CONTAINING NUCLEAR FUEL PARTICLES FOR HIGH TEMPERATURE REACTORS

Karl-Gerhard Hackstein, Hanau, Martin Kadner, Dornigheim, and Horst Förster, Hanau, Germany, assignors to Nukem Nuklear-Chemie und- Metallurgie, GmbH, Wolfgang, near Hanau am Main, Germany

No Drawing. Filed June 29, 1971, Ser. No. 158,094

Claims priority, application West Germany, July 28, 1970, P 20 37 232.1

Int. Cl. C01g *43/02*

U.S. Cl. 252—301.1 R **12 Claims**

Spherical oxide or carbide fuel particles of uranium and/or thorium are formed by dropping an aqueous salt solution of the heavy metal, e.g., uranyl and/or thorium nitrate into an alkaline, preferably ammoniacal, precipitation bath. The solution also includes an organic polymer, preferably polyvinyl alcohol or partially hydrolyzed polyvinyl acetate, which delays the precipitation of the heavy metal compound in an alkaline medium. The polymer must be able to maintain the surface tension in spite of the precipitation of the uranium or thorium. The polymer is precipitated by an alcohol, e.g. primary or isopropyl alcohol followed by conventional drying, hardening calcining, and sintering or melting the product.

3,781,217

METHOD OF REPRESSING THE PRECIPITATION OF CALCIUM FLUOZIRCONATE

Billie J. Newby and Donald W. Rhodes, Idaho Falls, Idaho, assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed July 3, 1972, Ser. No. 268,262

Int. Cl. C01g *43/00*

U.S. Cl. 252—301.1 W **9 Claims**

Boric acid or a borate salt is added to aqueous solu-

tions of fluoride containing radioactive wastes generated during the reprocessing of zirconium alloy nuclear fuels which are to be converted to solid form by calcining in a fluidized bed. The addition of calcium nitrate to the aqueous waste solutions to prevent fluoride volatility during calcination, causes the precipitation of calcium fluozirconate which precipitate further tends to form a gel at fluoride concentrations of 3.0 M or greater. The boron containing species which are introduced into the solution by the addition of the boric acid or borate salt retard the formation of the calcium fluozirconate precipitate and prevent formation of the gel. These boron containing species can be introduced into the solution by the addition of a borate salt but preferably are introduced by the addition of an aqueous solution of boric acid.

3,781,218

HYDROXY-FATTY ACID AMIDE POLYOXYALKYLENE ETHER: SOAP COMPOSITIONS

Horoshi Suzuki and Yoshiro Tsutsui, Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,845
Claims priority, application Japan, Mar. 7, 1970, 45/19,500

Int. Cl. B01f *17/22;* **C07c** *103/12;* **C11d** *9/46*
U.S. Cl. 252—356 **1 Claim**

As non-ionic surface active agents are generally low in toxicity they are commonly used as additives in pharmaceuticals, cosmetics, foodstuffs, etc. However, non-ionic surface active agents which exhibit antimicrobial action or rust-inhibiting property have not hitherto been known. The present invention uses hydroxy-fatty acid amide polyoxyalkylene ether, as the active ingredients. As this substance is superior in antimicrobial action and rust-inhibiting property, the surface active agents manufactured according to the present invention exhibit not only the superior properties inherent in the conventional surface active agents, e.g., emulsifying and dispersing power, but also superior rust-inhibiting property and antimicrobial action. Further, if metal soap is added to the surface active agents, the aforementioned properties become more conspicuous.

3,781,219

HALIDE ADDITION AND DISTRIBUTION IN THE REACTIVATION OF PLATINUM-RHENIUM CATALYSTS

Marvin F. L. Johnson, Homewood, and Stuart L. Graff, Calumet City, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Mar. 20, 1970, Ser. No. 21,551
The portion of the term of the patent subsequent to Jan. 2, 1989, has been disclaimed

Int. Cl. B01j *11/18*
U.S. Cl. 252—415 **19 Claims**

A process for reactivation, including chlorination, of a fixed bed of carbon-fouled, platinum group metal- and rhenium-containing, alumina-supported catalyst is disclosed which involves contacting the catalyst with an oxygen-containing gas, then with a gaseous stream containing inert gas, oxygen and vaporous chlorine-containing agent until at least about 0.2% chlorine has been added to the catalyst based on the total weight of catalyst in the bed. Contact of the catalyst is then continued with a gaseous stream containing inert gas, oxygen and a minor amount of water vapor to distribute chlorine in the catalyst bed.

3,781,220

CATALYST FOR ETHYLENE POLYMERIZATION AND COMPOLYMERIZATION WITH α-OLEFINS

Alexandr Evgenievich Shilov, Vorobievskoe shosse 2, kv. 22, Moscow, U.S.S.R.; Fridrikh Stepanovich Dyachkovsky, ulitsa Tretya 2, kv. 2, p/o Chernogolovka, Moskovskaya oblast, Noginsky raion, U.S.S.R.; Nikolai Mikhailovich Chirkov, ulitsa Vavilova 55/5, kv. 6, Moscow, U.S.S.R.; and Petr Evgenievich Matkovsky, ulitsa Pervaya 16, kv. 26, p/o Chernogolovka, Moskovskaya oblast; Khaim-Mordkhe Aronovich Brikenshtein, ulitsa Vtoraya 5, kv. 1, p/o Chernogolovka, Moskovskaya oblast; Galina Albertovna Beikhold, obschezhitie NNTS, kv. 412, p/o Chernogolovka, Moskovskaya oblast, and Ljudmila Nikolaevna Russian, ulitsa Pervaya 2a, kv. 41, p/o Chernogolovka, Moskovskaya oblast, all of Noginsky raion, U.S.S.R.

No Drawing. Filed May 20, 1971, Ser. No. 145,521

Int. Cl. C08f *3/04*
U.S. Cl. 252—429 B **5 Claims**

A catalyst for ethylene polymerization and copolymerization with α-olefins, comprising a cyclopentadienyl of a Me- or MeO- halide, such as dicyclopentadiene compounds of titanium, vanadium and zirconium chlorides; an organometallic compound, such as diethylaluminum chloride, a Lewis acid such as $AlCl_3$, BF_3, $SnCl_4$, $TiCl_4$, ethylaluminum dichloride and tetraalkyl tin compounds and a halogen containing solvent.

As a Lewis acid aluminum trichloride, ethylaluminum dichloride, tetraalkyltin, boron trifluoride or tin tetrachloride is preferably used.

The present catalyst finds application in the processes of proudcing polymers based on ethylene and may be particularly employed for producing impact-resistant polyethylene.

3,781,221

CATALYST COMPOSITIONS CONTAINING PLATINUM AND LEAD AND PROCESS FOR PREPARING THE SAME

Naoya Kominami, Tokyo, Toshiyuki Iwaisako, Ol, and Kusuo Ohki, Yamato, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,197
Claims priority, application Japan, Aug. 18, 1970, 45/71,733

Int. Cl. B01j *11/12*
U.S. Cl. 252—432 **15 Claims**

Novel catalyst compositions are provided comprising an alumina carrier with pores of a pore diameter distribution having a peak in the range of 2,000–7,000 A. and an active agent containing platinum and lead supported on said alumina carrier. Such a catalyst composition can be prepared by a process comprising incorporating powdered alumina into specific organic substance, subjecting the resulting mixture to a molding, followed by firing to produce an alumina carrier having pores of the abovementioned specific pore diameter distribution and making the active agent supported on the alumina carrier. The thus obtained catalyst is, due to its selective high activity, particularly useful in the reforming of hydrocarbons.

3,781,222

DEHYDRATION CATALYSTS, PARTICULARLY FOR THE DEHYDRATION OF DIOLS

Joseph Edouard Weisang and Georges Szabo, Le Havre, and Jean Maurin, Montivilliers, France, assignors to Compagnie Francaise de Raffinage, Paris, France

No Drawing. Filed Apr. 9, 1971, Ser. No. 132,892
Claims priority, application France, Apr. 16, 1970, 7013791

Int. Cl. B01j *11/82*
U.S. Cl. 252—437 **4 Claims**

Catalysts and methods of preparing the same for the dehydration of diols, e.g. 2-methyl-2,3-butanediol to isoprene, constituted at least in part of a pyrophosphate of at least one metal belonging to the group consisting of lithium, sodium, strontium, and barium.

3,781,223
CATALYST FOR OXIDATIVE DEHYDROGENATION

Darrell W. Walker, Floyd E. Farha, Jr., and Brent J. Bertus, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

No Drawing. Filed May 6, 1971, Ser. No. 140,966
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 **5 Claims**

Organic compounds are dehydrogenated to compounds having a higher degree of unsaturation by contacting the feedstock in the vapor phase in the presence of an oxygen-containing gas with a catalyst comprising at least one of nickel, cobalt or iron in association with tin and phosphorus. Representative of such conversions is the oxidative dehydrogenation of butane to butenes and butadiene, isopentane to isoamylenes and isoprene, and butenes to butadiene. The conversion products are valuable compounds particularly useful as intermediates for the preparation of polymeric materials such as synthetic rubbers and the like.

3,781,224
METHOD OF ACTIVATING A CATALYST

Natale Ferlazzo, Milan, Giambattista Antonelli, Brugherio, and Giancarlo Aglietti, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,201
Claims priority, application Italy, Nov. 12, 1970, 31,630/70
Int. Cl. B01j *11/06, 11/50*
U.S. Cl. 252—447 **11 Claims**

Silver-based catalysts for the oxidation of ethylene are activated by heating in nitrogen then in nitrogen with an oxygen content progressively raised to 20%.

3,781,225
TREATMENT OF COLLOIDAL ZEOLITES

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 842,014, July 15, 1969. This application Apr. 17, 1972, Ser. No. 244,907
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z **17 Claims**

This invention relates to treatment of formed colloidal size zeolites to facilitate subsequent processing by removing soluble salts from aqueous suspension of said colloidal zeolite in the mother liquor remaining after crystallization, without appreciably changing the zeolite concentration in the suspension. Such treatment involves contacting said zeolite suspension with cation and anion exchange resin particles larger than about 10 microns in diameter.

3,781,226
TREATMENT OF COLLOIDAL ZEOLITES

Albert B. Schwartz, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 842,014, July 15, 1969. This application Apr. 17, 1972, Ser. No. 244,908
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z **12 Claims**

This invention relates to treatment of formed colloidal size zeolite to facilitate subsequent processing by removing soluble salts from an aqueous suspension of said colloidal zeolite in the mother liquor remaining after crystallization, without appreciably changing the zeolite concentration in the suspension. Such treatment involves contacting the aqueous suspension of the zeolite with a semipermeable membrane which is in contact, at the side opposite the zeolite suspension, with an aqueous treating solution.

3,781,227
CATALYST FOR HYDROGENATION OF NITRO-COMPOUNDS AND A METHOD OF PRODUCING SAME

Dmitry Vladimirovich Sokolsky, prospekt Abaya 31, kv. 38; Gaukhar Daulenovna Zakumbaeva, prospekt Abaya 31, kv. 36; Kair Akhmetovich Zhubanov, prospekt Abaya 34, kv. 21; Evgeny Petrovich Mazin, ulitsa Spartaka 14, kv. 4; and Nikolai Illarionovich Scheglov, ulitsa Aue Zova 136, kv. 22, all of Alma-Ata, U.S.S.R.; and Evgeny Pavlovich Fokin, ulitsa Pravdy 1, kv. 14; and Vladimir Arkadievich Livanov, Novosibirsk, ulitsa Zoloto-Dolinskaya 9, kv. 28, both of Novosibirsk, U.S.S.R.

No Drawing. Filed Jan. 15, 1971, Ser. No. 106,932
Int. Cl. B01j *11/22*
U.S. Cl. 252—466 J **6 Claims**

A catalyst for the hydrogenation of nitro-compounds which is comprised of a nickel-aluminum alloy promoted with a metal or mixtures of metals of Group VIII and containing an addition of a metal of the Group II.

A method of producing said catalyst comprising alloying nickel and aluminum with a metal or mixtures of metals of Group VIII and a metal of Group II with the subsequent leaching of 3–5 wt. percent of aluminum from the alloy obtained.

The present catalyst exhibits high stability, is capable of a prolonged and continuous service life, providing an 80–100% yield of the desired products.

3,781,228
LAUNDRY PRODUCT CONTAINING ENZYME

Robert William McDonnell, Teaneck, and Maung Hla Win, Berkeley Heights, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 733,298, May 31, 1968. This application Dec. 17, 1971, Ser. No. 209,355
Int. Cl. C11d *3/22, 7/42, 11/00*
U.S. Cl. 252—539 **6 Claims**

Laundry product containing granules of a binding agent, such as polyvinyl alcohol or caroxyalkyl cellulose, and a detergent builder salt, such as sodium tripolyphosphate, and bound to and substantially homogeneously distributed on the surface of the granules, an enzyme.

ERRATUM

For Class 260—22 TN see:
Patent No. 3,781,214

3,781,229
STORAGE STABLE PREMIX FOR PRODUCTION OF POLYURETHANE FOAM

William E. Smith and Charles M. Orlando, Schenectady, N.Y., and Robert W. Barito, Louisville, Ky., assignors to General Electric Company, Schenectady, N.Y.

No Drawing. Filed Oct. 31, 1972, Ser. No. 302,426
Int. Cl. C08g *22/34, 22/48, 41/04*
U.S. Cl. 260—2.5 BE **6 Claims**

A method for making rigid foam is provided by using an amine catalyst and blowing agent with a stable premix of an isocyanate terminated prepolymer and an epoxy resin. The premix is stabilized by the use of an effective amount of certain Lewis acid stabilizers, such as thionyl chloride.

3,781,230
MICROCAPSULAR OPACIFIER SYSTEM

Anthony E. Vassiliades, Deerfield, Edward F. Nauman, Lake Forest, and Shrenik Shroff, Chicago, Ill., assignors to Champion International Corporation, New York, N.Y.

Original application Dec. 23, 1968, Ser. No. 786,337, now Patent No. 3,585,149. Divided and this application Mar. 16, 1971, Ser. No. 124,985
Int. Cl. B01j *13/02;* **B44d** *1/02;* **C09d** *5/00*
U.S. Cl. 260—2.5 B **29 Claims**

Opacifiers comprising air-containing microcapsules hav-

ing an average particle diameter of below about one micron provide highly opaque surfaces when coated onto and/or incorporated into fibrous and non-fibrous substrates. The opacifiers are produced by heating liquid-containing precursor microcapsules at temperatures sufficient to expel the liquid and provide air in the microcapsule.

3,781,231

PHYSICALLY REINFORCED HYDROPHILIC FOAM AND METHOD OF PREPARING SAME

Edward W. Janssen, Roseville, and Robert C. Kyle, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Sept. 17, 1971, Ser. No. 181,559

Int. Cl. C08g *22/44, 51/14*

U.S. Cl. 260—2.5 BE **6 Claims**

Resilient, relatively dense, open-celled, filled polyoxyalkylene/polyisocyanate foam compositions of high resistance to bottoming out which are highly hydrophilic and dimensionally stable with absorption of water, and a process for the preparation of these compositions.

3,781,232

GRAFT COPOLYMERS HAVING BRANCHES WHICH ARE ALTERNATING COPOLYMERS, AND PROCESSES THEREFOR

Norman G. Gaylord, New Providence, N.J., assignor to Gaylord Research Institute, Inc., Newark, N.J.

No Drawing. Filed Aug. 25, 1970, Ser. No. 66,885

Int. Cl. C08f *24/56*

U.S. Cl. 260—17.4 GC **11 Claims**

A method for preparing novel graft copolymers in which the branches are alternating copolymers, by reacting two comonomers, under conditions whereby alternating copolymers are formed, in the presence of an agent capable of forming a complex with one of the monomers and a preformed polymer having active hydrogen atoms.

3,781,233

BLOWING AGENTS

Erwin Muller, Leverkusen, Wolf-Dieter Wirth, Odenthal, Johannes Blahak, Cologne, and Harry Rohr, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 25, 1972, Ser. No. 256,730

Claims priority, application Germany, May 26, 1971, P 21 26 145.0

Int. Cl. C08j *1/20*

U.S. Cl. 260—2.5 R **13 Claims**

The invention relates to the use of bisbenzazimide compounds as blowing agents for the production of cellular and porous articles from acrylonitrile, butadiene and styrene copolymers. The blowing agents do not liberate any corrosive, discoloring, malodorous or toxic decomposition products.

3,781,234

FLEXIBLE POLYAMIDE HOT MELT ADHESIVE MADE FROM ETHYLENE DIAMINE AND AN ACID COMPONENT CONTAINING A POLYMERIC FATTY ACID AND HEPTADECANE DICARBOXYLIC ACID

Manfred Drawert, Werne, and Eugen Griebsch, Unna, Germany, assignors to Schering AG., Bergkamen, Germany

No Drawing. Filed June 20, 1972, Ser. No. 264,545

Claims priority, application Germany, June 26, 1971, P 21 31 931.3

Int. Cl. C08g *20/00*

U.S. Cl. 260—18 N **3 Claims**

Flexible polyamides, suitable for use as hot melt adhesives and as coating materials, prepared by condensing ethylene diamine with an acid component comprising 1,8- and/or 1,9-heptadecane dicarboxylic acid, a dimerized fatty acid, and, optionally, a further codicarboxylic acid having 7 to 20 carbon atoms.

3,781,235

METHOD FOR MAKING RIGID FOAM AND COMPOSITIONS USING SUCH METHOD

Gene F. Trott, Clarksville, Ind., and William E. Smith, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

No Drawing. Filed Oct. 31, 1972, Ser. No. 302,427

Int. Cl. C08g *22/48, 45/12*

U.S. Cl. 260—2.5 BE **6 Claims**

A method for making rigid foam is provided by using an amine catalyst and blowing agent with a stable premix of an isocyanate terminated prepolymer and an epoxy resin. The premix is stabilized by the use of a dicarbonyl compound, such as an aliphatically unsaturated imide or anhydride.

3,781,236

METHOD OF TREATING A POLYMER LATEX

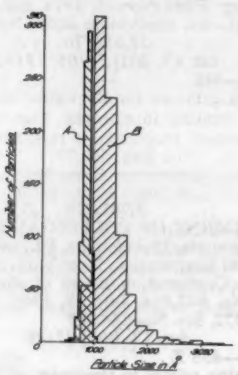
Kenneth John Bassham, Southampton, and Alan Arthur John Feast, Eastleigh, England, assignors to The International Synthetic Rubber Company Ltd., Southampton, Hampshire, England

Filed June 9, 1972, Ser. No. 261,391

Claims priority, application Great Britain, June 14, 1971, 27,748/71

Int. Cl. C08d *9/14*

U.S. Cl. 260—23.7 M **8 Claims**



A method of modifying the particle size distribution of a carboxylated polymer latex comprises:

(1) admixing with the latex sufficient of a second emulsifier, which is an organic carboxylic acid salt, at least partially to replace the first emulsifier on the latex particles with the second emulsifier, and

(2) passing the latex containing at least 15% by weight of polymer particles through a constriction at a pressure of not less than 1,000 p.s.i.g.

The process is particularly applicable to latices having a particle size of less than 1,000 A. enabling a latex of increased number average particle size to be obtained. This, in turn, enables concentration of the treated latex to a high solids content.

3,781,237

USE OF A POLYSILOXANE TO ELIMINATE SURFACE FLAWS IN IMIDE AND AMIDE-IMIDE POLYMER FILMS

William M. Alvino and William R. Koryak, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 94,944, Dec. 3, 1970. This application July 13, 1972, Ser. No. 271,428

Int. Cl. C08g *41/04, 47/10*

U.S. Cl. 260—29.1 SB **12 Claims**

A casting solution, comprising a solvent solution of

an aromatic polyamic acid and an effective amount of a lower alkyl polyorganosiloxane, is applied as a wet film to a substrate and cured at an elevated temperature to provide defect free high temperature polyimide and polyamide-imide films.

3,781,238

AQUEOUS CHAIN EXTENSION OF NCO PREPOLYMER WITH TERTIARY AMINO POLYOL USING NONIONIC SURFACTANT, AND AQUEOUS DISPERSION PRODUCED

Joan K. Helm, Buffalo, N.Y., assignor to Textron, Inc.

No Drawing. Continuation of abandoned application Ser. No. 768,892, Oct. 18, 1968. This application Aug. 4, 1971, Ser. No. 169,061

Int. Cl. C09d 5/02; C08g 22/14

U.S. Cl. 260—29.2 TN **24 Claims**

There is disclosed a method for preparing an aqueous dispersion from a free isocyanate group-containing polyurethane prepolymer made from diisocyanate and polyoxypropylene polyol or polyoxybutylene polyol. The prepolymer is reacted with a defined tertiary aminopolyol, e.g., methyl diethanolamine, in the presence of a hydroxyl-containing, nonionic surface-acting agent and water. The resulting aqueous dispersion of polyurethane is particularly useful as a coating for various solid substrates.

3,781,239

FLUOROCARBON POLYMER COMPOSITION CONTAINING AN ADHESION PROMOTER

James Derek Birchall, Norley, John Edward Cassidy, Hartford, and Frank Smith, Widnes, England, assignors to Imperial Chemical Industries, Limited, London, England

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,635

Claims priority, application Great Britain, Dec. 11, 1970, 59,006/70, 59,009/70

Int. Cl. C08f 45/22, 45/72

U.S. Cl. 260—30.6 R **10 Claims**

This invention relates to fluorocarbon polymer compositions. In particular it relates to dispersions of fluorocarbon polymers in liquid media and dry mixtures containing fluorocarbon polymers. The invention also relates to methods of making such compositions and to methods of coating substrates using compositions in liquid media. It further relates to articles made from or made by use of fluorocarbon polymer compositions.

3,781,240

POLYIMIDE MOLDING POWDERS

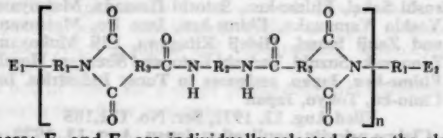
Hyman R. Lubowitz, Hawthorne, Calif., assignor to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,417

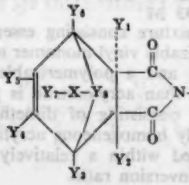
Int. Cl. C08g 20/32, 51/02, 51/10

U.S. Cl. 260—37 NT **6 Claims**

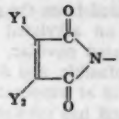
Improved polyimide molding powders are formed at low cost by pyrolytically polymerizing compounds of the general formula



where: E_1 and E_2 are individually selected from the class consisting of



and



where:

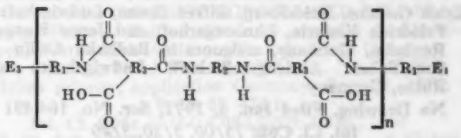
X is a member of the class consisting of carbon, oxygen, sulfur, and carbonyl Y_1–Y_6; and Y_7 and Y_8 when present, are individually selected from the class consisting of hydrogen, aromatic groups, substituted aromatic groups, saturated or unsaturated hydrocarbon groups, having 1 to 6 carbon atoms, alkyl ethers, aryl ethers, halogens, and nitro groups;

R_1 and R_2 are individually selected from the class consisting of aromatic groups, substituted aromatic groups, saturated and unsaturated hydrocarbon groups, saturated and unsaturated heterocyclic groups, and mixtures thereof;

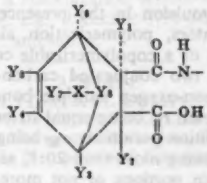
R_3 is selected from the class consisting of substituted aromatic groups, unsubstituted aromatic groups, saturated cyclic groups, unsaturated cyclic groups, saturated heterocyclic groups, and unsaturated heterocyclic groups, and

n is one or more for a single prepolymer and statistically greater than 0 for a mixture.

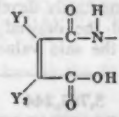
The molding powders may also be formed by pyrolytically polymerizing the novel amic-acid precursors of said prepolymers which are characterized by the formula



where: E_3 and E_4 are individually selected from the class consisting of



and



where: X_1, Y_1–Y_6 and Y_7 and Y_8 are defined as defined above; and R_1, R_2, R_3 and n are as defined above.

3,781,241

FRICTION PARTICLE FOR BRAKE LINING

Frank S. Grazen, Melvin L. Buike, and Frank M. Bryzinsky, North Tonawanda, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application Oct. 30, 1969, Ser. No. 872,753, now Patent No. 3,658,751. Divided and this application Oct. 12, 1971, Ser. No. 188,598

Int. Cl. C08g 37/18, 51/10

U.S. Cl. 260—38 **8 Claims**

A friction particle, useful in applications where cashew nut shell oil friction particles have been used, may be prepared by the reaction at a temperature from about 225

to about 400 degrees Fahrenheit of a non-oxyalkylated resole with resin selected from the group consisting of an oxyalkylated resole, an alkylated resole, an alkylated novolac, an oxyalkylated novolac, and mixtures thereof until it is insoluble, infusible, and does not soften slightly under mechanical force at temperatures below about 400 degrees Fahrenheit, and has substantially no cohesive or bonding strength.

3,781,242

LIGHT STABILIZED POLYPROPYLENE CONTAINING A HINDERED PHENOL, A PHOSPHITE AND A BENZOTRIAZOLE

Ronald D. Mathis, Taylors, S.C., and Jack P. Guillory, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Feb. 17, 1972, Ser. No. 227,252
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.7 P 1 Claim

Polymeric compositions are stabilized against degradation in physical and chemical properties from exposure to actinic radiation by incorporating into such compositions an additive system comprising at least one secondary organic phosphite ester in combination with at least one 2-(2'-hydroxy-5'-alkylphenyl)benzotriazole. Optionally, the stabilizer additive systems further comprise hindered phenols.

3,781,243

POLYMERIZATION OF VINYL AND VINYLIDENE COMPOUNDS

Erich Gulbins, Heidelberg, Alfred Hauss, Ludwigshafen, Friedrich Kieferle, Limburgerhof, and Jenoe Kovacs, Roxheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Jan. 6, 1971, Ser. No. 104,491
Int. Cl. C08f *15/00, 3/30, 3/40*
U.S. Cl. 260—87.5 C 3 Claims

Homopolymerization or copolymerization of vinyl chloride, vinylidene chloride or vinyl acetate M in bulk, suspension or emulsion in the presence of free radical generating initiators, polymerization aids and at least 0.1% by weight of a copolymerizable compound R containing at least two conjugated carbon-carbon, carbon-nitrogen or carbon-oxygen multiple bonds, the copolymerization parameter r_R being equal to or greater than 1, the copolymerization parameter r_M being less than 1 and the ratio $r_R:r_M$ being more than 20:1, and the compound R being added in portions of not more than 0.01% by weight (based on the monomers M) to the polymerization mixture when the momentarily developed heat of polymerization has exceeded the desired value, said addition being continued until the said value is again reached.

3,781,244

PROCESS FOR PREPARING EPOXIDIC RESINS

Silvio Vargiu and Mario Pitzalis, Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed Apr. 24, 1972, Ser. No. 247,165
Claims priority, application Italy, Apr. 30, 1971, 23,913/71
Int. Cl. C08g *30/04*
U.S. Cl. 260—47 EP 7 Claims

Improved epoxy resins, for electrical and other purposes, are prepared in a two-stage process in which an intermediate epoxy product is prepared from epichlorohydrin and 2,2'-bis(4-hydroxycylohexyl) propane in the presence of sodium hydroxide in equivalent quantities with respect to the epichlorohydrin, and the product is caused to react with a further quantity of bisphenol A until epoxy resins are obtained which have epoxy equivalents in excess of approximately 1,000.

3,781,245

TITANIUM HYDRIDE CATALYZED POLYESTER POLYCONDENSATION

Yoshio Itabashi, Susumu Saito, and Masao Seki, Hofu, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 868,884, Oct. 23, 1969. This application Mar. 10, 1972, Ser. No. 233,812
Claims priority, application Japan, Oct. 25, 1968, 43/78,122, 43/78,123
Int. Cl. C08g *17/015*
U.S. Cl. 260—75 R 3 Claims

Polyalkylene terephthalates and polyesters consisting mainly of the polyalkylene terephthalate are produced easily and cheaply by using titanium hydride having a low hydrogenation degree or a mixture of metallic titanium and stoichiometric titanium hydride as a catalyst. The thus obtained polyesters are substantially colorless and have an even color tone between lots.

3,781,246

PROCESS FOR THE PRODUCTION OF POLYIMIDES BY REACTING A SCHIFF BASE WITH A CYCLIC ACID ANHYDRIDE

Wilfried Zecher, Cologne-Stammheim, and Rudolf Merten, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 41,680, May 25, 1970, which is a continuation of application Ser. No. 748,209, July 29, 1968, both now abandoned. This application Dec. 3, 1971, Ser. No. 204,774
Claims priority, application Germany, Aug. 7, 1967, F 53,163
Int. Cl. C08g *20/32*
U.S. Cl. 260—78 TF 2 Claims

A process for the production of polyimides by reaction of Schiff's bases and cyclic dicarboxylic acid anhydrides at temperatures of from 0 to 450° C.

3,781,247

PYROLYTIC POLYMERIZATION CATALYST

Eugene A. Burns, Palos Verdes Peninsula, and Robert J. Jones, Hermosa Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

No Drawing. Filed Feb. 1, 1972, Ser. No. 222,692
Int. Cl. C08f *27/00*
U.S. Cl. 260—78.4 D 6 Claims

Polymerization times and temperatures for alicyclic endo capped prepolymers are reduced by the inclusion of a Lewis acid-type catalyst. Effective amounts ranging preferably 1% to 3% by weight of a Lewis acid selected from any of the alkyl derivatives of or the halide salts of tin, aluminum, zirconium, zinc, vanadium, antimony, germanium, or titanium may be added to the prepolymer.

3,781,248

METHOD OF PRODUCING ACRYLIC COPOLYMER

Hiroshi Sakai, Ehime-ken, Satoshi Hamada, Matsuyama, Yoshio Yamanaka, Ehime-ken, Isao Ito, Matsuyama, and Zenji Izumi, Hideji Kitagawa, Eiji Mukoyama, Zennosuke Suzuki, Tadashi Kato, and Shuntaro Hosaka, Ehime-ken, Japan, assignors to Toray Industries, Inc., Chuo-ku, Tokyo, Japan

Filed Aug. 12, 1971, Ser. No. 171,185
Claims priority, application Japan, Aug. 13, 1970, 45/70,436
Int. Cl. C08f *3/76, 15/22*
U.S. Cl. 260—793 M 5 Claims

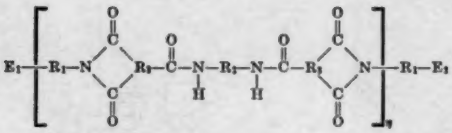
A monomer mixture consisting essentially of acrylonitrile, a polymerizable vinyl monomer more hydrophobic than acrylonitrile and a polymerizable vinyl monomer more hydrophilic than acrylonitrile is polymerized in a reaction medium consisting of dimethyl sulfoxide and water. A relatively homogeneous acrylic copolymer dispersion is obtained within a relatively short period of time at a high conversion ratio.

3,781,249
POLYAMIDE-IMIDES AND PRECURSORS THEREOF

Hyman R. Lubowitz, Hawthorne, Calif., assignor to TRW Inc., Redondo Beach, Calif.

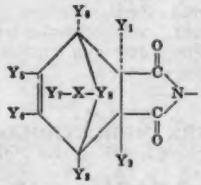
No Drawing. Filed Dec. 30, 1971, Ser. No. 214,416
Int. Cl. C08g 20/32, 51/02
U.S. Cl. 260—78 TF 31 Claims

Polyamide-imides having high thermal and mechanical stability formed at low cost by pyrolytically polymerizing novel prepolymers of improved solubility characterized by the general formula

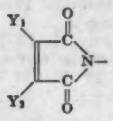


where:

E_1 and E_2 are individually selected from the class consisting of



and



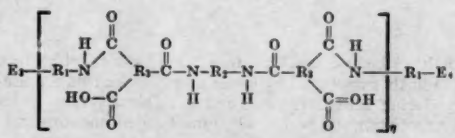
where: X is a member of the class consisting of carbon, oxygen, sulfur, and carbonyl Y_1–Y_6; and Y_7 and Y_8 when present, are individually selected from the class consisting of hydrogen, aromatic groups, substituted aromatic groups, saturated or unsaturated hydrocarbon groups having from 1 to 6 carbon atoms, alkyl ethers, aryl ethers, halogens, and nitro groups;

R_1 and R_2 are individually selected from the class consisting of aromatic groups, substituted aromatic groups, saturated and unsaturated hydrocarbon groups, saturated and unsaturated heterocyclic groups, and mixtures thereof;

R_3 is selected from the class consisting of substituted aromatic groups, unsubstituted aromatic groups, saturated cyclic groups, unsaturated cyclic groups, saturated heterocyclic groups, and unsaturated heterocyclic groups; and

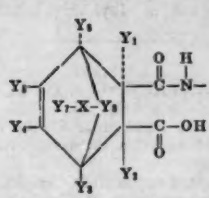
η is one or more for a single prepolymer and statistically greater than 0 for a mixture;

The polyamide-imides may also be formed by pyrolytically polymerizing the novel amic-acid precursors of said prepolymers which are characterized by the formula

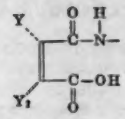


where:

E_3 and E_4 are individually selected from the class consisting of



and



where: X_1, Y_1–Y_6 and Y_7 and Y_8 are defined as defined above; and

R_1, R_2, R_3 and η are as defined above.

The pyrolytically polymerized prepolymer is useful as an adhesive, molding composition, coating, or as a matrix material in the preparation of high strength laminates and composites.

3,781,250
PROCESS FOR THE VULCANIZATION OF HOMO- OR COPOLYMERS OF CONJUGATED DIENES

Jurgen Wolpers, Haltern, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,757
Claims priority, application Germany, Feb. 24, 1970, P 20 08 479.1
Int. Cl. C08c 11/54; C08d 9/00; C08f 27/06
U.S. Cl. 260—79.5 B 8 Claims

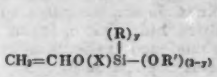
Vulcanizates of homo- and copolymers of conjugated dienes with improved heat-aging characteristics are produced employing a vulcanization system which comprises an organic dithiol, e.g., dodecane-1,12-dithiol, a vulcanization accelerator, and sulfur.

3,781,251
ALKOXY SILYL ALKYL COMPOUNDS AND POLYMERS THEREOF

Matthew Edward Hermes, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Apr. 28, 1970, Ser. No. 32,739, now Patent No. 3,714,214. Divided and this application Sept. 29, 1971, Ser. No. 184,948
Int. Cl. C08f 15/02, 15/06
U.S. Cl. 260—80.71 6 Claims

A silyl vinyl ether having the formula



wherein X is an alkylene group of 2 to 10 carbon atoms, or an alkyleneoxyalkylene group of 4 to 16 carbon atoms, R is an alkyl group of 1 to 6 carbon atoms, y is 0, 1 or 2, and R′ is an alkyl group of 1 to 6 carbon atoms; silyl fluoroolefin polymers made by polymerizing the silyl vinyl ether with fluoroolefins, and, optionally, with other vinyl ethers and/or ethylene and/or propylene and/or fluorine-substituted vinyl ether; compositions containing polysilicic acid and silyl fluoroolefin polymer made by polymerizing the silyl vinyl ether with fluoroolefin, and, optionally, with other vinyl ethers; coating compositions containing a compatible solvent and the polysilicic acid/silyl fluoroolefin polymer composition; articles coated with the silyl-fluoroolefin polymer/polysilicic acid com-

position and a process for coating them; and polymers made by polymerizing the silyl vinyl ether with formaldehyde or trioxane and, optionally, with alkylene oxides and/or dioxolane and/or alkyl vinyl ethers.

3,781,252

POLYMERS CONTAINING A DIFLUOROAMINO RADICAL

Raymond M. Price, Applegate, Calif., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Original application Oct. 23, 1969, Ser. No. 869,454. Divided and this application June 15, 1971, Ser. No. 155,674

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.73 **10 Claims**

High energy copolymers or terpolymers that have high NF_2 content. The polymers are used in solid propellant composition and are made by incorporation of small quantities of non-energetic monomer molecules with basic side chain ester groups into energetic difluoramino polymers by copolymerization techniques which increase the affinity of the polymers for acidic difluoramino plasticizers [e.g., TVOPA, 1,2,3-tris(1,2-bis-(difluoramino) ethoxy)propane] or OPE, 1,2-bis[2,2,3-tris(difluoramino) propoxy] - 1,2 - bis(difluoroamino)ethane. Higher plasticizer to polymer ratios result in a higher difluoramino content in the binder system and a correspondent higher energy propellant wherein used. Representative of the non-energetic monomer molecules, (also referred to as inert nonfunctional material), are methyl acrylate and methyl methacrylate which are paired in a reaction with a selected energetic difluoramino material such as 2,3-bis(difluoramino)propyl acrylate (NFPA), 2,3-bis(difluoramino)propyl methacrylate (NFPMA), or the like to yield a copolymer. A ternary copolymer is produced when a functional monomer selected from hydroxyethyl acrylate, hydroxyethyl methacrylate, hydroxypropyl methacrylate, or hydroxypropyl acrylate, is employed along with the paired reactants of the reaction. The resulting ternary copolymer is a prepolymer capable of being cured to form polyurethane polymers. Further, a ternary copolymer having different functionality results when a functional monomer selected from glycidyl methacrylate, glycidyl acrylate, acrylic acid, or methacrylic acid is employed in a reaction with the paired reactants specified above. This type ternary copolymer is capable of being cured to epoxy polymers.

3,781,253

PROCESS FOR THE PREPARATION OF ETHYLENE POLYMER OR COPOLYMER

Akikazu Mori, Otake, Hideo Nara, Iwakkuni, Toshiki Kataoka, Waki-Mura, Norio Kashiwa and Tadaichi Tokuzumi, Otake, and Yutaka Horota and Hiroshi Fujimura, Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

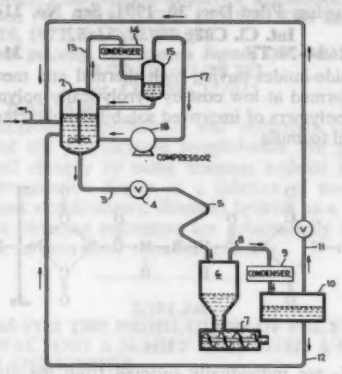
Continuation of abandoned application Ser. No. 881,718, Dec. 3, 1969. This application May 15, 1972, Ser. No. 253,654

Claims priority, application Japan, Dec. 3, 1968, 43/88,081

Int. Cl. C08f *1/42, 3/06, 15/04*

U.S. Cl. 260—85.3 R **4 Claims**

A process for the preparation of polyethylene which comprises polymerizing ethylene in solution phase (the solution phase excludes a polymer or copolymer existing in solid phase, but included such polymer in molten state), in a polymerization solvent of linear or cyclic pentane, hexane, or heptane in the presence of a carrier-supporting Ziegler catalyst, while maintaining the polymer concentration in the polymerization system at not higher than 20% by weight and controlling the polymerization temperature by forcedly circulating an inert gas through the polymerization zone; subjecting the liquid phase reaction product containing the formed ethylene polymer or copolymer in molten state to a lower pressure not higher than the polymerization pressure, which allows vaporization of the solvent in the liquid phase, to evaporate and separate the solvent; and recovering the softened or molten state ethylene polymer or copolymer from which the solvent has been removed.



3,781,254

PROCESS FOR THE PRODUCTION OF POLYMERS IN THE PRESENCE OF A REDOX CATALYST SYSTEM

Friedrich Engelhardt, Frankfurt am Main, and Joachim Ribka, Offenbach am Main, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main, Germany

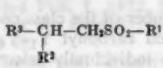
No Drawing. Filed July 31, 1972, Ser. No. 276,598

Claims priority, application Germany, Aug. 10, 1971, P 21 39 959.7

Int. Cl. C08f *3/90, 15/22*

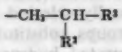
U.S. Cl. 260—85.5 R **4 Claims**

Compounds of the formula

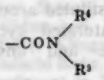


(I)

wherein R^1 is alkyl, cycloalkyl, aryl, aralkyl, one of the aforesaid radicals substituted by lower alkyl or chlorine, or



R^2 is hydrogen or methyl and R^3 is carboxyl, carboxylate base addition salt radical,



wherein R^4 and R^5 are hydrogen or alkyl, cyano, $COOR^6$ wherein R^6 is alkyl, alkanoyl, cycloalkanoyl, benzoyl, phenylacetyl or one of said

$COOR^6$ alkanoyl, cycloalkanoyl, benzoyl or phenylacetyl radicals substituted by lower alkyl or chlorine are used as reducing component in a redox catalyst system in the polymerization of olefinically unsaturated monomers.

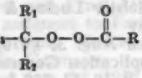
3,781,255

PROCESS FOR THE SUSPENSION OF POLYMERIZATION OF VINYL CHLORIDE

Thomas Balwe, Johann Bauer, and Alex Sabel, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

No Drawing. Filed July 28, 1970, Ser. No. 59,022
Claims priority, application Germany, Aug. 8, 1969, P 19 40 475.2
Int. Cl. C08f 3/22
U.S. Cl. 260—87.1 1 Claim

Process for polymerizing vinyl chloride, and for copolymerizing vinyl chloride and up to 30% by weight of other ethylenically unsaturated monomers in aqueous phase containing a suspension agent, which comprises heating the suspension to a temperature of 30 to 90° C., under a pressure of up to 15 atmospheres, in the presence of a mixture of acetyl cyclohexyl sulfonyl peroxide and a perester of branched carboxylic acids and α-branched hydroperoxides of the general formula



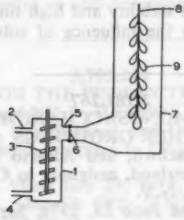
where R represents branched alkyl groups with 3 to 18 C atoms, R_1 hydrogen or alkyl groups with 1 to 4 C atoms, R_2 alkyl groups with 1 to 4 C atoms and R_3 straight-chain or branched alkyl groups with 1 to 18 C atoms.

3,781,256

PROCESS AND INSTALLATION FOR THE PREPARATION OF HOMO- OR COPOLYMERS OF ETHYLENE

Constant P. M. Sadee, Brunssum, Christianus W. J. van Koppen, Sittard, and Henricus A. A. Koenders, Geleen, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Nov. 29, 1971, Ser. No. 202,873
Claims priority, application Netherlands, Nov. 27, 1970, 7017347; July 21, 1971, 7110020
Int. Cl. C08f 1/60, 3/04, 15/00
U.S. Cl. 260—86.7 2 Claims



A process and apparatus is described to minimize the danger of aerial explosions which occur during the high pressure, high temperature polymerization of ethylenic monomers. The process involves rapidly discharging at least 0.3 kg. of water per kg. of reactor contents into the safety passageway and outlet pipe within 10 seconds following the operativeness of such safety passageway by the opening of valve means when an excessive pressure level is reached within the reactor. Various apparatus structures are also disclosed adapted for practicing this process wherein the water is held in rupturable bags or, e.g., is discharged into the escaping gas stream through valve-operated spray means, or in other ways.

3,781,257

COPOLYMERIZATION OF CYCLOPENTENE WITH POLYCYCLIC POLYOLEFINES

Gottfried Pampus and Nikolaus Schon, Leverkusen, Josef Witte, Cologne, and Gunter Marwede, Leverkusen, Germany, assignors to Bayer Aktiengeselischaft, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 93,472, Nov. 27, 1970. This application Dec. 2, 1971, Ser. No. 204,372
Claims priority, application Germany, Dec. 10, 1969, P 19 61 865.6
Int. Cl. C08f 15/04
U.S. Cl. 260—88.2 D 7 Claims

A process for the preparation of copolymers from cyclic monoolefins and cyclic polyolefins by polymerization in an inert organic solvent in the presence of an organo-metallic mixed catalyst, characterized in that the catalyst used is an organo-metallic mixed catalyst of (a) a reaction product of a tungsten halogen compound with an epoxide or a halogen substituted and (b) an organic aluminum compound.

3,781,258

POLYTETRAFLUOROETHYLENE POWDER AND METHOD OF PREPARATION THEREOF

Yutaka Kometani, Sanda-shi, Shun Koizumi, Osaka, and Takeshi Suzuki, Takeaki Nakajima, and Chuzo Okuno, Settsu-shi, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

No Drawing. Continuation-in-part of application Ser. No. 456,551, May 17, 1965. This application Sept. 11, 1968, Ser. No. 759,218
Int. Cl. C08f 3/24, 47/02
U.S. Cl. 260—92.1 3 Claims

A method of preparing a polytetrafluoroethylene powder having good fluidity which comprises stirring at a temperature of 0–200° C. in the presence of water a composition consisting of one part by weight of a polytetrafluoroethylene powder the diameters of which particles are not more than 300 microns and 0.1–3.0 parts by weight of a water immiscible liquid having a boiling point 0–150° C. and capable of wetting polytetrafluoroethylene, the amount of said water being 1.5–50 parts by weight based on the composition.

3,781,259

POLYMERIZATION OF ACENAPHTHYLENE AND INDENE

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Sept. 29, 1970, Ser. No. 76,606
Int. Cl. C08f 7/02
U.S. Cl. 260—93.5 C 4 Claims

A method and catalyst for polymerizing acenaphthylene and indene employing a hydrocarbyl aluminum dihalide catalyst.

3,781,260

PROCESS FOR METALATION

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 44,468, June 8, 1970, which is a continuation-in-part of application Ser. No. 712,946, Mar. 14, 1968. This application Oct. 21, 1971, Ser. No. 191,098
Int. Cl. C08d 5/02
U.S. Cl. 260—94.7 A 16 Claims

A polymer (either a dead polymer or a lithiated live polymer) which contains a plurality of olefinic and/or aryl groups is metalated by reacting with (a) a hydrocarbon lithium and (b) a compound of an alkali metal other than lithium in which the metal is attached to a hetero atom, such as a hydroxide, alkoxide, a thiosalt or an amide. The resulting metalated polymer can be

reacted to introduce reactive groups of different types, such as carboxyl, hydroxyl, etc. along the chain. For example, polybutadiene can be reacted with n-butyllithium and sodium or potassium alkoxide, and the resulting product can then be reacted with styrene or carbon dioxide, etc. and then neutralized to produce a polybutadiene containing styryl or carboxyl, etc. groups.

3,781,261

METALATING RUBBER POLYMERS

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Feb. 3, 1972, Ser. No. 223,365
Int. Cl. C08d *5/02*
U.S. Cl. 260—94.7 **2 Claims**

Rubber polymers which are (1) homopolymers or copolymers of conjugated dienes or (2) copolymers of a conjugated diene and a vinyl aromatic monomer are metalated by reaction with alkyl or aryl sodium or potassium in combination with a lithium alkoxide. Sodium or potassium alkoxide may also be present.

3,781,262

PROCESS FOR METALATION

Adel F. Halasa, Bath, and Mark L. Stayer, Suffield, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 4, 1972, Ser. No. 223,620
Int. Cl. C08d *5/02*
U.S. Cl. 260—94.7 A **2 Claims**

Polymers and copolymers of conjugated dienes (butadiene, isoprene, etc.) and copolymers of such a conjugated diene with a vinyl aromatic hydrocarbon (styrene, etc.) are metalated with an alkyl lithium, e.g. butyllithium, together with a mixture of (1) a potassium or sodium alkoxide and (2) lithium t-butoxide.

3,781,263

PROCESS FOR METALATION

Adel F. Halasa, Bath, and George B. Mitchell, Canton, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed July 13, 1972, Ser. No. 271,474
Int. Cl. C08d *5/02*
U.S. Cl. 260—94.7 A **4 Claims**

Polymers and copolymers of conjugated dienes (butadiene, isoprene, etc.) and copolymers of such a conjugated diene with a vinyl aromatic hydrocarbon (styrene, etc.) are metalated with an alkyl lithium, e.g. butyllithium, together with potassium hydroxide or potassium oxide or a potassium salt of an inorganic acid.

3,781,264

PROCESS FOR TEXTURIZING MICROBIAL CELLS BY ALKALI-ACID TREATMENT

Cavit Akin, Oakbrook, Ill., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Oct. 29, 1970, Ser. No. 85,282
Int. Cl. C07g *7/00;* **D01f** *9/04*
U.S. Cl. 260—112 R **8 Claims**

Protein-containing single cel micro-organisms are prepared into texturized products by a process in which an aqueous slurry of protein-containing microbial cells is mixed with an acid or alkaline activating agent to activate the cell mixture after which the activated mixture of protein-containing microbial cells and activating agent is passed through an acid bath, if an alkaline activating agent is employed, or through an alkaline bath, if an acid activating agent is employed, the acid bath having a pH in the range of about 3.5 to 5.5 and the alkaline bath having a pH in the range of about 7.5 to 10.5. The texturized protein product prepared by the process is suitable for use as an additive to or a substitute for conventional foods. In addition, the protein products prepared by the process are suitable, for example, in the preparation of bio-degradable containers, packaging materials, and utensils.

3,781,265

METHOD OF PREPARING CONSISTENTLY HIGH-QUALITY VINYLIDENE FLUORIDE POLYMER

Julius Eugene Dohany, Berwyn, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed Oct. 17, 1972, Ser. No. 298,328
Int. Cl. C08f *3/22, 15/08*
U.S. Cl. 260—92.1 R **5 Claims**

Vinylidene fluoride polymers of high-quality are prepared consistently by a process of suspension polymerization in which the chain transfer agent (acetone), initiator (diisopropylperoxydicarbonate), reaction accelerator (1, 1,2-trichlorotrifluoroethane) and monomer are fed incrementally to the aqueous reaction medium.

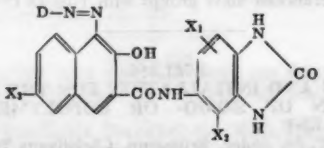
3,781,266

WATER-INSOLUBLE PHENYL-AZO-NAPHTHYL-AMIDO-BENZIMIDAZOLONE DYESTUFFS

Erich Dietz, Kelkheim, Taunus, Joachim Ribka, Offenbach am Main, and Willi Steckelberg, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,607
Claims priority, application Germany, Aug. 21, 1969, P 19 42 507.1
Int. Cl. C09b *29/20, 29/36;* **D06p** *1/08*
U.S. Cl. 260—157 **7 Claims**

Water-insoluble monoazo dyestuffs of the general formula



wherein D is a radical of the terephthalic acid mono amide series and X_1, X_2 and X_3 are hydrogen, halogen, alkyl or alkoxy. Said pigments can be used, for instance, for the dyeing, printing or coloring of lakes, lake-formers, solutions or products made of acetyl cellulose, natural or synthetic resins, polystyrene, polyolefins, polyacrylic compounds, polyvinyl compounds, polyesters, rubber, casein or silicone resins, textile fibers, cellulose ethers or esters, polyamides, polyurethanes or paper. These dyestuffs show good fastness properties to light, weather and migration; have a high thermal stability and high tinctorial strength; and are resistant to the influence of solvents, acids and alkalis.

3,781,267

O-ESTERS OF MONOSACCHARIDES HAVING ETHER GROUPINGS

Roland Jaques, Allschwil, and Alberto Rossi, Oberwil, Basel-Land, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed June 23, 1970, Ser. No. 49,185
Claims priority, application Switzerland, July 3, 1969, 10,204/69
Int. Cl. C07c *47/18, 69/32*
U.S. Cl. 260—210 R **10 Claims**

The invention concerns O-esters of monosaccharides with optionally substituted 2-R—O-benzoic acids, which ester compounds contain at least one saccharide hydroxy group esterified by a 2-R—O-benzoyl residue, in which R represents hydrogen, an optionally substituted hydrocarbon residue, or the acyl residue of an organic acid, and at least one saccharide-hydroxy group etherified by an optionally substituted hydrocarbon residue, and in which ester compounds further saccharide hydroxy groups may be free, etherified by an optionally substituted hydrocarbon residue, or esterified by the acyl residue of an organic acid, which exhibit antiinflammatory, antiarthritic and analgesic effects.

3,781,268

ANTIBIOTIC DERIVATIVES OF KANAMYCIN

Hiroshi Kawaguchi, Takayuki Naito, and Susumu Nakagawa, Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 162,315, July 13, 1971. This application Jan. 27, 1972, Ser. No. 221,378
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 AB 13 Claims

Derivatives of kanamycin A and B have been prepared which possess substantially improved antibacterial activity. An example of such an agent is 1-[L-(−)-γ-amino-α-hydroxybutyryl]-kanamycin A [IVa, BB–K8].

3,781,269

2,3-ALKYLIDENE-RHAMNOPYRANOSIDES AND PROCESS FOR PREPARING THEM

Werner Haede and Ulrich Stache, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, Kurt Radscheit, Kelkheim, Taunus, and Ernst Lindner, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 29, 1971, Ser. No. 138,762
Claims priority, application Germany, May 2, 1970, P 20 21 557.0
Int. Cl. C07c *173/00*
U.S. Cl. 260—210.5 4 Claims

Rhamnopyranosides substituted by alkylidene, cyclohexylidene and tetrahydropyranylidene are disclosed as being effective therapeutic agents against cardiac insufficiency.

3,781,270

SUBSTITUTED METHANO DIBENZAZOCINES AND DIBENZAZONINES

William J. Houlihan, Baden, Austria, and Jeffrey Nadelson, Parsippany, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,128
Int. Cl. C07d *41/00*
U.S. Cl. 260—239 BB 3 Claims

Dibenz[c,f] azocines and dibenz[c,g] azonines, e.g. 5,12-dihydro - 6 - methyl-5,12-methano-6H-dibenz[c,f] azonines. More partciularly, it relates to substituted methano-5H-dibenz[c,g] azonine hydrochloride are prepared by reducing a corresponding azocinone or azononone and are useful as anti-depressant agents.

3,781,271

PROCESS FOR THE PRODUCTION OF 14β-HYDROXY-Δ16- AND 7α-HYDROXY-Δ4-STEROIDS

Hansuli Wehrli, Schaffhausen, and Oskar Jeger, Zollikerberg, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed July 20, 1971, Ser. No. 164,432
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.55 R 19 Claims

The present invention concerns a process for the production of 14β-hydroxy-Δ16-steroids and 7α-hydroxy-Δ4-steroids which simultaneously are substituted in the 20- or 3-position respectively by an oxo radical and α may be further substituted as defined, and the new compounds obtained thereby the process consists in reacting corresponding 14β,15β-epoxy-20-oxo-Δ16-steroids or 6α,7α-epoxy-3-oxo-Δ4-steroids in the presence of a pallidum hydrogenation catalyst such as palladium on barium sulphate with a partially hydrogenated aromatic hydrocarbon such as cyclohexene. Compounds obtained by this process are useful as intermediates for the synthesis of batrachotoxinine A or analogs thereof. Specific embodiments are 3β-methoxy-3α,9α-epoxy-11α,18-diacetoxy-14β - hydroxy - 20-oxo-Δ16-5β-pregnene and 3β-methoxy-3α,9α-epoxy-7α,9α, 18-triacetoxy-14β-hydroxy-20-oxo-Δ16-5β-pregnene.

3,781,272

TRIPEPTIDE

George Rogelio Flouret, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Mar. 24, 1972, Ser. No. 237,877
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 8 Claims

The new blocked tripeptide Y-(N^ω-R')Arg-Pro-Gly-R wherein R is hydroxy, methoxy or amino, R' is a suitable blocking group and Y is hydrogen or an easily removable protective group has been found to be a valuable intermediate for the preparation of large peptide chains, such as for instance, the decapeptide Gn-RH.

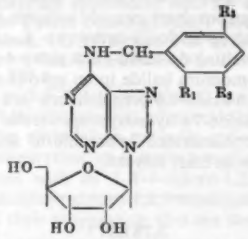
3,781,273

N(6)-BENZYL-ADENOSINE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

Wolfgang Kampe, Heddesheim, Erich Fauland, Mannheim-Waldhof, Max Thiel, Mannheim, Karl Dietmann, Mannheim-Vogelstang, and Wolfgang Juhran, Mannheim, Germany, asssignors to Boehringer Mannheim GmbH, Mannheim, Germany

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,424
Claims priority, application Germany, Feb. 18, 1970, P 20 07 273.5
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R 18 Claims

Novel 2,3- or 2,5-disubstituted N(6)-benzyl-adenosine derivatives of the following formula



wherein

R_1 is halogen, alkyl, alkoxy or alkylthio;

R_2 and R_3 are members of the group consisting of hydrogen, halogen, alkyl, alkoxy and alkylthio with the proviso that one and only one of R_2 and R_3 is hydrogen;

are outstandingly effective coronary dilators and lower the free fatty acid content of serum.

3,781,274

2-METHYLTHIOADENOSINE-5'-MONOPHOSPHATE

Mary Helen Maguire and Geoffrey Gough, Mosman, and Frank Michal, Lane Cove, New South Wales, Australia, assignors to The University of Sydney, New South Wales, Australia

No Drawing. Original application Dec. 8, 1969, Ser. No. 883,354, now Patent No. 3,678,162. Divided and this application Jan. 21, 1972, Ser. No. 219,912
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R 2 Claims

2-methylthioadenosine-5'-monophosphate and the ammonium, sodium and potassium salts thereof and pharmaceutical compositions and methods of inhibiting or preventing thrombus formation with these compounds.

3,781,275

ELECTRICAL SUBSTRATES

Louis J. Lombardi, Roselle, Roy J. Coyne, Oak Lawn, and Charles E. Green, Brookfield, Ill., assignors to The Richardson Company, Cook County, Ill.

No Drawing. Original application Sept. 12, 1969, Ser. No. 857,571, now Patent No. 3,681,474. Divided and this application Apr. 27, 1972, Ser. No. 247,944
Int. Cl. C08g *45/18*
U.S. Cl. 260—227 6 Claims

A circuit board with hydrocarbon substrate based on a

polymer of a C_4 to C_8 conjugated diene with more than 50% of its unsaturation being 1,2 is improved by the combination of a second hydrocarbon polymer with lower amounts of 1,2 unsaturation and correspondingly higher amounts of 1,4 unsaturation.

3,781,276

6-AZIDO-6-DEHYDRO STEROIDS OF THE PROGESTERONE SERIES, METHODS FOR THEIR MANUFACTURE AND INTERMEDIATES PRODUCED THERBY

Elliot L. Shapiro, Cedar Grove, N.J., George J. Teutsch, Nancy, France, and Hershel L. Herzog, Glen Ridge, N.J., assignors to Schering Corporation, Bloomfield, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 58,163, July 24, 1970. This application July 11, 1972, Ser. No. 272,937

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.55 **26 Claims**

6-azido-6-dehydroprogesterones and 6-azido-1,6-bis-dehydroprogesterones possess progestational and anti-androgenic properties. Preferred are the 6-azido-16-methylene-17α-lower alkanoyloxy-4,6-pregnadiene-3,20-diones. Compounds useful as intermediates are 6β-azido-7α-hydroxyprogesterones and the 7α-acylates thereof.

The 6-azido-6-dehydroprogesterones are prepared by treating a 6α,7α-oxido-4-pregnene with an alkali metal azide in an aqueous inert organic solvent; esterifying the thereby formed 6β-azido-7α-hydroxy - 4 - pregnene; and treating the resulting 6β-azido-7α-acyloxy-4-pregnene with a tetraalkylammonium halide in an aprotic solvent. Alternatively, the 6-azido-4,6-pregnadienes are prepared by treating a 6β-azido-7α-hydroxyprogesterone or 7α-acylate thereof with concentrated hydrochloric acid in a lower alkanoic acid in an inert solvent.

3,781,277

DIOXO-THIAZOLIDINYL DERIVATIVES OF 6-AMINOPENICILLANIC ACID

Ronnie D. Carroll, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed July 27, 1971, Ser. No. 166,561

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **5 Claims**

Novel dioxo-thiazolidinyl derivatives of 6-aminopenicillanic acid which exhibit activity against a variety of gram negative organisms are disclosed. A typical embodiment of 6-[2-(2,4-dioxo-5-thiazolidinyl)acetamido]penicillanic acid.

3,781,278

NOVEL p-PHENYLSTILBYL HETEROCYCLIC AND NAPHTHYL-VINYLPHENYLENE HETEROCYCLIC OPTICAL BRIGHTENERS

Adolf Emil Siegrist, Basel, Peter Liechti, Binningen, Erwin Maeder, Aesch, Basel-Land, Leonardo Guglielmetti, Birsfelden, and Hans Rudolf Meyer and Kurt Weber, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of abandoned application Ser. No. 588,318, Oct. 21, 1966. This application Aug. 28, 1970, Ser. No. 68,014

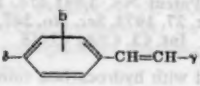
Claims priority, application Switzerland, Oct. 28, 1965, 14,902/65; July 4, 1966, 9,649/66

Int. Cl. C09b *23/00*

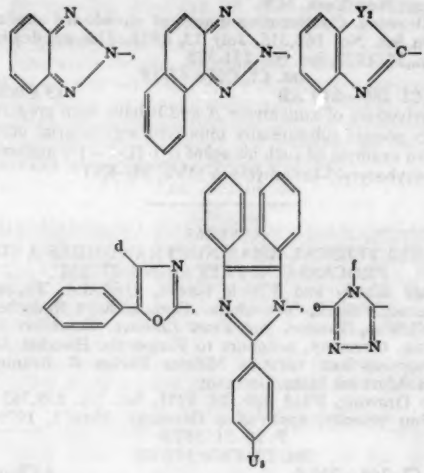
U.S. Cl. 260—240 CA **6 Claims**

The present invention relates to new compounds of the formula

(I)



in which *b* represents a hydrogen atom or a methyl group, γ represents a diphenyl or 1-naphthyl or 2-naphthyl residue and δ denotes a residue of the series



where (I) *d* represents hydrogen or phenyl, *e* and *f* represent phenyl, stilbenyl, p-phenylstilbenyl or benzostilbenyl, and furthermore Y_2 represents a bridge member —O— ,—NH— or —N(alkyl)—, where (II) U_5 denotes hydrogen, a styryl residue or a p-phenylstyryl residue, and where (III) terminal phenyl or naphthyl residues may contain alkyl, halogen or alkoxy groups. These new compounds represent valuable optical brightening agents.

3,781,279

STILBENE OPTICAL BRIGHTENERS

Nathan N. Crounse and Kantilal B. Desai, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Filed Feb. 23, 1971, Ser. No. 118,076

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 CA **2 Claims**

Benzofurans, benzothiophenes, indoles, naphthofurans and benzofuranobenzofurans which are substituted by 4-vinylphenyl groups wherein the 2-position of the vinyl is substituted by a monovalent aromatic radical having one to three aromatic rings are optical brightening agents useful for whitening and brightening natural and synthetic fibers, papers, resins and the like. The compounds are conveniently prepared by interacting benzofurans, benzothiophenes, indoles, naphthofurans or benzofuranobenzofurans which are substituted by a p-tolyl group, with an aromatic aldehyde or preferably the anil derivative thereof.

3,781,280

FLUORO-PYRIDINE DERIVATIVES AND THERAPEUTICALLY ACCEPTABLE SALTS THEREOF

Lars Anders Fritz Carlsson, Bromma, Ake John Erik Helgstrand, Enhorna, and Berndt Olof Harald Sjoberg and Nils Erik Stjernstrom, Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

No Drawing. Continuation-in-part of application Ser. No. 689,751, Nov. 15, 1967, now Patent No. 3,637,714, dated Jan. 25, 1972. This application Aug. 20, 1971, Ser. No. 173,679

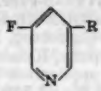
Claims priority, application Sweden, Nov. 16, 1966, 15,717/66; Great Britain, Mar. 23, 1967, 13,687/67; Apr. 26, 1967, 19,174/67

Int. Cl. C07d *31/34*

U.S. Cl. 260—240 J **18 Claims**

Compounds selected from the group consisting of

fluoro-pyridine derivatives of the general formula



and therapeutically acceptable salts thereof. These compounds exhibit vasodilating properties and are effective in lowering excessive lipid and free fatty acid concentration in serum of animals, including man.

3,781,281

2-ARYLIDENE - 1,3-DITHIOLES AND PREPARATION THEREOF FROM ACETYLENES, CARBON DISULFIDE, AND AROMATIC ALDEHYDES IN THE PRESENCE OF ALIPHATIC PHOSPHINES

Harris Dale Hartzler, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 55,596, July 16, 1970. This application Nov. 8, 1972, Ser. No. 304,596

Int. Cl. C07d *71/00*

U.S. Cl. 260—240 F **15 Claims**

Disclosed herein is a new process for making 2-arylidene-1,3-dithioles, novel products made thereby and a utility for the products, i.e., the inhibition of vinyl polymerization. The process comprises reacting an aromatic aldehyde or dialdehyde with carbon disulfide and an acetylenic compound in the presence of a trihydrocarbylphosphine.

3,781,282

CEPHALOSPORIN PROCESS AND PRODUCT

William L. Garbrecht, 4114 Ponderosa Blvd., Indianapolis, Ind. 46250

No Drawing. Filed Jan. 20, 1971, Ser. No. 108,218

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **8 Claims**

Cephalosporin esters are de-esterified by reduction in acid medium in DMF, the cephalosporin values are separated as a complex thereof with DMF, and if desired, the complex is purified by dissolution in an acidified DMF/polar solvent mixture, and precipitation therefrom with added base to pH 6.5 to 7.5. Cephalosporin antibiotic, e.g., cephalexin, can be recovered from purified cephalosporin·DMF complex by dissolution in acidified water, heating the solution to 40° to 70° C. to form the monohydrate, and treating the solution with base to raise the pH to the isoelectric point of the antibiotic in that solvent system. If unsolvated cephalosporin antibiotic is desired, the complex can be dissolved in aqueous acetonitrile with the aid of acid, and separated from that medium by adjusting the pH to the isoelectric point in that medium.

3,781,283

PROCESS FOR PREPARING CEPHEM-4-CARBOXYLIC ACID ESTERS

Dieter Bormann, Kelkheim, Taunus, and Manfred Worm, Mainz, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

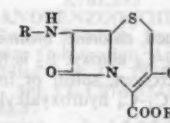
No Drawing. Filed Dec. 28, 1971, Ser. No. 213,217

Claims priority, application Germany, Dec. 28, 1970, P 20 64 107.0

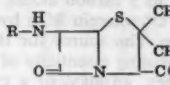
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **6 Claims**

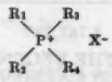
Process for preparing a cephem-carboxylic acid ester of the formula



by heating a penicillin oxide of the formula



in a solvent with a phosphonium salt of the formula



In the formulas: R is acyl; R′ is alkyl, substituted alkyl, cycloalkyl, or aryl; R_1, R_2, and R_3 are each substituted or unsubstituted hydrocarbon; R_4 is methyl substituted by an electron-attracting group, and may contain a further substituent; and X is an anion.

3,781,284

PROCESS FOR MAKING 4-(3-AMINO-2-HYDROXY-PROPOXY)-1,2,5-THIADIAZOLES

Leonard M. Weinstock, Belle Mead, Roger J. Tull, Metuchen, and Dennis M. Mulvey, Whitehouse Station, N.J., assignors to Charles E. Frosst & Co., Kirkland, Quebec, Canada

No Drawing. Original application Apr. 21, 1969, Ser. No. 818,474, now Patent No. 3,657,237. Divided and this application Aug. 16, 1971, Ser. No. 172,232

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 **4 Claims**

Preparation of S-3-X-4-(3-substituted amino-2-hydroxypropoxy)-1,2,5-thiadiazole beta adrenergic blocking agents using as starting material an optically active alkamine in the sinister configuration, or a derivative of said alkamine, which is reacted with an 3-X-4-chloro-1,2,5-thiadiazole. Novel 3-morpholino-4-chloro-1,2,5-thiadiazoles and novel alkamines and their preparation also are described.

3,781,285

CYANOISOTHIAZOLYL BIS(DITHIOCARBAMATES)

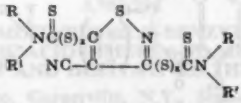
John Joseph D'Amico, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 861,137, Sept. 25, 1969. This application Oct. 4, 1971, Ser. No. 186,416

Int. Cl. C07d *91/12;* **C08f** *27/06*

U.S. Cl. 260—247.1 **13 Claims**

Cyanoisothiazolyl bis(dithiocarbamates) of the formula



wherein R and R′ individually are alkyl, cycloalkyl, or aryl, and R and R′ together with the nitrogen atom form a heterocycle, and x is 1 or 2 which are useful for accelerating the vulcanization of rubber.

3,781,286

PROCESS FOR THE PREPARATION OF AMIDES OF NITROGEN HETEROCYCLIC COMPOUNDS

Francesco Minisci, Milan, Remo Galli, Torricella del Pizzo, and Adolfo Quilico, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,445

Claims priority, application Italy, Nov. 21, 1969, 24,704/69

Int. Cl. C07d *51/76, 51/78*

U.S. Cl. 260—250 R **5 Claims**

A process is disclosed for the preparation of amides of nitrogen aromatic heterocyclic bases wherein a hetero-

aromatic base, preferably in salt form is reacted with a formamide, $HCONR_2$, wherein R is hydrogen or an alkyl group having from 1 to 5 carbon atoms, preferably CH_3, and with a radical R'O• wherein R' is hydrogen, an alkyl or a cycloalkyl group. The source for the R'O• radicals is a redox system consisting essentially of $R'OOH+Fe^{++}$, wherein R' is hydrogen, an alkyl or a cycloalkyl group, at temperatures between −10° and 60° C., and preferably at temperatures between −5° and +35° C.

3,781,287

PROCESS FOR THE REGENERATION OF DEACTIVATED CARBON CATALYST

Yelagondahally S. Suryanarayana and Luther J. Reid, Jr., Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed May 11, 1971, Ser. No. 142,392

Int. Cl. C07d *55/42*

U.S. Cl. 260—248 C **2 Claims**

A process for regenerating deactivated (spent) carbon catalyst by subjecting the catalyst to a treatment with chlorine gas at a temperature of at least 375° C. for a time period of at least five minutes, and preferably several hours. Desirably, the amount of chlorine gas used is at least about 0.1 lb. to about 1 lb. for each lb. of the spent carbon catalyst being treated.

3,781,288

1-METHYL-3-HALOMETHYL-2,4-DIOXO-1,3-DIHYDROQUINAZOLINES

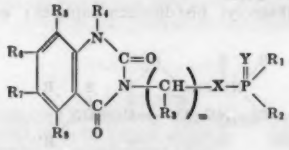
Daniel D. Rosenfeld, East Brunswick, and Martin L. Gorbaty, Elizabeth, N.J., assignors to Esso Research and Engineering Company

No Drawing. Original application Apr. 22, 1970, Ser. No. 31,008, now Patent No. 3,681,352. Divided and this application May 22, 1972, Ser. No. 255,360

Int. Cl. C07d *51/48*

U.S. Cl. 260—260 **2 Claims**

Uracil phosphates containing a fused aromatic ring have been shown to possess insecticidal activity. The structures of these compounds can be characterized as follows:



wherein R_5, R_6, R_7 and R_8 can be the same or different and can equal hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl, halogen, cyano, thiocyano, nitro, C_2–C_6 carboalkoxy, C_1–C_6 haloalkyl, C_2–C_6 acyl, C_1–C_6 alkylsulfoxide and sulfone, C_1–C_6 thioalkyl, C_1–C_6 alkoxy, C_1–C_6 alkylamino and C_2–C_6 dialkylamino, C_1–C_6 sulfonamido and carboxylic acid; X is O or S; Y is O or S; *m* is 1 or 2; R_1 is C_1–C_6 alkoxy, C_1–C_6 thioalkyl, C_6–C_{10} aryl, C_6–C_{10} aryloxy and C_1–C_6 alkyl; R_2 is C_1–C_6 alkoxy, C_1–C_6 thioalkyl, C_6–C_{10} aryl, C_6–C_{10} aryloxy, and C_1–C_6 alkyl; R_3 is hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl, C_1–C_6 haloalkyl and C_6–C_{10} haloaryl; R_4 is hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl, C_1–C_6 haloalkyl, C_6–C_{10} haloaryl, C_1–C_6 alkylamino, C_2–C_6 dialkylamino, C_2–C_6 acyl, C_1–C_6 alkylsulfoxide or sulfonyl, C_1–C_6 alkoxy, C_2–C_6 alkyloxyalkyl and C_2–C_6 alkylthioalkyl.

3,781,289

7-CHLORO-1-METHYL-5-PHENYL-s-TRIAZOLO [4,3-a]QUINOLINES

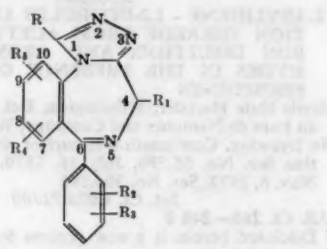
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application Feb. 9, 1971, Ser. No. 114,049, now Patent No. 3,709,898. Divided and this application May 11, 1972, Ser. No. 252,506

Int. Cl. C07d *33/50*

U.S. Cl. 260—288 R **2 Claims**

A multistep process for the production of triazolobenzodiazepines of the Formula I:



I

wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; wherein R_1 is hydrogen or alkyl defined as above; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting hydrogen, alkyl defined as above, fluorine, chlorine, bromine, nitro, cyano, trifluoromethyl, alkoxy of 1 to 3 carbon atoms, inclusive, amino, alkanoylamino in which the alkanoyl group is of 1 to 3 carbon atoms, inclusive, alkylthio, in which the alkyl group is defined as above, alkylsulfinyl, in which the alkyl group is defined as above, and dialkylamino, in which the alkyl group is defined as above, and for some of intermediates is claimed. The final compounds and intermediates are tranquilizers and sedatives and are useful in mammals, including man and birds.

3,781,290

PHENOXYPHENYL PHENYLTHIOPHENYL AND PHENYLAMINOPHENYL PIPERAZINYLTHIOUREAS

Ruediger Spaun, Bottmingen, Alain Claude Rochat, Birsfelden, Jean-Jacques Gallay, Magden, and Paul Brenneisen, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

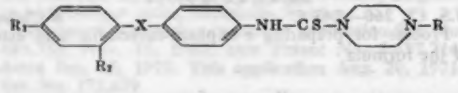
No Drawing. Filed Aug. 27, 1971, Ser. No. 175,723

Claims priority, application Switzerland, Sept. 2, 1970, 13,111/70; Dec. 23, 1970, 19,065/70

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 C **10 Claims**

New thioureas in which a p-phenoxyphenyl, p-phenylthio-phenyl or p-phenylaminophenyl radical is attached to one nitrogen atom and which are substituted at the other nitrogen atom either by two lower alkyl groups or a polymethylene bridging member of 2 to 6 carbon atoms, whereby one of the methylene groups can be replaced by an optionally substituted imino group, processes for the production of the new compounds and compositions containing these compounds. Particularly useful as anthelmintic agents are compounds of the formula



in which R_1 is hydrogen, chlorine, bromine, C_1–C_4 alkyl, C_1–C_4 alkylthio or C_1–C_4 alkoxy; R_2 is hydrogen, C_1–C_4 alkyl or nitro; X is oxygen, sulfur or imino; and R is C_1–C_4 alkyl, phenyl, C_1–C_4 hydroxyalkyl or ethoxy carbonyl.

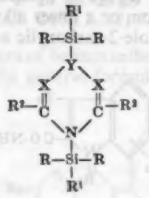
3,781,291

SILYLATED 1,4-DIHYDROPYRIDINES

Reinhard A. Sulzbach, Basseisdoferstrasse 111, Kloten, Switzerland, and Abul F. M. Iqbal, Steinackerstrasse 8, Glattbrugg, Switzerland

No Drawing. Filed May 26, 1971, Ser. No. 147,191
Int. Cl. C07d *29/40*
U.S. Cl. 260—290 H 4 Claims

Silylated nitrogen containing heterocyclic compositions of the formula



wherein X and Y are selected from the group consisting of C—R^3 and N with the proviso that no nitrogen atom is adjacent to another nitrogen atom; R is a member selected from the group consisting of hydrocarbyl, heterocyclic, silyl and stannyl wherein the member may be attached via an oxygen atom; R^1 is a member selected from the group consisting of hydrocarbyl, heterocyclic, silyl, stannyl and hydrogen wherein the member may or may not be attached via an oxygen atom; R^2 is a member selected from the group consisting of hydrocarbyl, heterocyclic, silyl, stannyl, hydrogen, tertiary amino, phosphino, oxophosphino, acetal and ketal wherein said member may or may not be attached via an oxygen atom and wherein R^2 and X together may be an ortho condensed cyclic or polycyclic system; and R^3 is a member selected from the group consisting of hydrocarbyl, heterocyclic, silyl, stannyl, hydrogen, tertiary amino, phosphino, oxophosphino, acetal and ketal wherein said member may or may not be attached via an oxygen atom.

Exemplary of such compositions are 1,4-bis-(trimethylsilyl)-1,4-dihydropyridine, 1,4,4-tris-(trimethylsilyl)-1,4-dihydropyridine, 1,4-bis-(trimethyl)-1,4-dihydroquinoline, and 1,4 - bis - (trimethylsilyl) - 1,4 - dihydropyrazine. The compositions of the invention are useful as catalysts for the addition of chlorosilanes to esters and ketones and as reducing agents for preparing hydrogenation catalysts from noble metal compounds such as rhodium and platinum.

3,781,292

SYNTHESIS OF PYRIDINE BASES FROM OLEFINS

Yasuo Kusunoki, Hiroshi Okazaki, Yoshinori Sato, and Eiichi Sano, Kitakyushu, Japan, assignors to Yawata Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Continuation of abandoned application Ser. No. 816,401, Apr. 15, 1969. This application Nov. 2, 1971, Ser. No. 195,042
Claims priority, application Japan, Apr. 19, 1968, 43/25,868
Int. Cl. C07d *31/06*
U.S. Cl. 260—290 P 15 Claims

Method for synthesizing pyridine bases by reacting olefins with ammonia in the presence of a palladium tetrammine complex which is provided with prolonged activity by means of a copper (II) salt and oxygen.

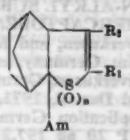
3,781,293

METHANOBENZO[b]THIOPHENES

Melvin Harris Rosen, Florham Park, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Aug. 13, 1971, Ser. No. 171,720
Int. Cl. C07d *63/18*
U.S. Cl. 260—293.57 3 Claims

2,3-diaryl-7a-amino - 3a,4,5,6,7,7a - hexahydro-4,7-methanobenzo[b]thiophene-1-oxides, e.g. those of the formula



Am=tert. amino
$R_{1,2}$=iso- or heterocyclic aryl
n=1 or 2

or salts thereof, are antifertility agents.

3,781,294

CERTAIN DIBENZO[b,f]THIEPIN[4,5-d] IMIDAZOLES

Joseph G. Lombardino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Original application Mar. 31, 1971, Ser. No. 129,977, now Patent No. 3,711,489. Divided and this application July 31, 1972, Ser. No. 276,597
Int. Cl. C07d *31/40, 49/36*
U.S. Cl. 260—294.8 A 6 Claims

2-substituted dibenzo[b,f]thiepin[4,5-d]- and dibenzo-[3,4,7,8]cycloöcta[1,2-d]imidazoles and the pharmaceutically acceptable acid addition salts thereof, a novel class of anti-inflammatory agent.

3,781,295

PYRIDYL KETIPATE LACTONES AND DERIVATIVES

Blaine M. Sutton, Hatboro, Pa., assignor to Smithkline Corporation

No Drawing. Original application July 6, 1971, Ser. No. 160,190, now Patent No. 3,714,173, dated Jan. 30, 1973. Divided and this application Sept. 7, 1972, Ser. No. 287,189
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 R 7 Claims

Pyridyl ketipate lactones and derivatives having anti-arthritic activity prepared by alcoholysis of an appropriate pyridyl substituted dilactone.

3,781,296

COMPLEX MIXTURES OF N-BENZYL-DIHYDRONICOTINIC ACID DIMERS AND METAL SALTS THEREOF AND DERIVATIVES THEREOF

Carl C. Greco, Garnerville, N.Y., Stanley B. Mirviss, Stamford, Conn., and Arthur E. Martell, College Station, Tex., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,201
Int. Cl. C07d *31/36*
U.S. Cl. 260—295.5 R 7 Claims

There is disclosed the preparation of novel compositions comprising complex mixtures of salts of di-(1-benzyl-3-carboxyl-1,2-dihydropyridyl-2) ethers, the salts of the corresponding sulfides and polysulfides and the position isomers and other products resulting from the reaction between a 1-benzyl-3-carboxy-pyridinium halide and an alkali metal, or ammonium, hydroxide, sulfide or polysulfide. These complex mixtures are particularly suitable for use as brightening agents of the alkaline cyanide zinc plating baths employed for the electrodeposition of zinc, as sequestrants and as stabilizers for plastics and rubbers.

3,781,297

PROCESS FOR PREPARING 2-AMINOBENZOTHIAZOLE AND ITS N-ALKYL SUBSTITUTION PRODUCTS FROM 2-MERCAPTOBENZOTHIAZOLE

Dieter Pawellek, Leverkusen, and Karlfried Wedemeyer, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,313
Claims priority, application Germany, Dec. 8, 1970, P 20 60 197.2
Int. Cl. C07d *91/46*
U.S. Cl. 260—305 6 Claims

2-aminobenzothiazole and its N-alkyl substituted products are prepared reacting 2-mercaptobenzothiazole with an amine and sulfur dioxide inthhe presence of a metal oxide, hydroxide or salt catalyst at elevated temperature and pressure.

3,781,298

PREPARATION OF 2-PYRROLIDINONE

Ronald I. Davis, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,685
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 FN 3 Claims

A process for preparing 2-pyrrolidinone which comprises reacting succinonitrile in aqueous solution and in the absence of added ammonia with hydrogen in the presence of a Raney cobalt catalyst, at a temperature of from about 250° C. to about 300° C. and at a hydrogen pressure of from about 2000 to about 3500 p.s.i.g.

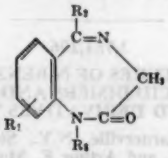
3,781,299

2-AMINOMETHYL-INDOLE DERIVATIVES

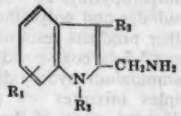
Hisao Yamamoto, Nishinomiya, Shigeho Inaba, Takarazuka, Toshiyuki Hirohashi, Kobe, Mitsuhiro Akatsu, Ikeda, Isamu Maruyama, Minoo, and Takahiro Izumi, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Original application Apr. 16, 1969, Ser. No. 816,824, now Patent No. 3,634,402. Divided and this application Nov. 19, 1970, Ser. No. 91,169
Claims priority, application Japan, Aug. 19, 1968, 43/59,363; Oct. 9, 1968, 43/73,797
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.15 1 Claim

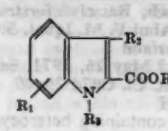
1,4-benzodiazepine derivatives, which are useful as tranquillizers, muscle-relaxants, anti-spasmodics and hypnotics and represented by the formula,



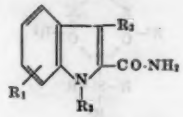
wherein R_1 signifies a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a trifluoromethyl group; R_2 signifies a lower alkyl group or an aralkyl group; and R_3 signifies a hydrogen atom, a lower alkyl group, an aralkyl group, a cycloalkylalkyl group or an unsubstituted or halogen-substituted phenyl group, are produced by contacting a 2-aminomethyl indole derivative of the formula,



wherein R_1, R_2 and R_3 are as defined above, with an oxidizing agent such as ozone, hydrogen peroxide, a peracid or chromic acid. The 2-aminomethyl indole derivative is produced, for example, by amidation of an indole-2-carboxylic acid derivative of the formula,



wherein R_1, R_2 and R_3 are as defined above, and R_4 signifies a hydrogen atom or a lower alkyl group, and reducing the resulting indole-2-carboxylic acid derivative of the formula,



wherein R_1, R_2 and R_3 are as defined above.

3,781,300

METHOD OF PRODUCING 2-HALO-3-SUBSTITUTED INDOLES

Milton Wolf, West Chester, John H. Sellstedt, St. Davids, and Harry Rosen, Drexel Hill, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application June 9, 1969, Ser. No. 831,702, now Patent No. 3,594,391. Divided and this application Jan. 15, 1971, Ser. No. 106,875
Int. Cl. C07d *27/56*
U.S. Cl. 260—326.15 1 Claim

There are disclosed 2-halo-3-substituted indoles which are useful as bronchodilators. Also disclosed is a process for preparing some of said compounds by halogenation of appropriate 3-substituted indoles.

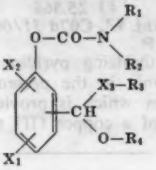
3,781,301

PHENYL CARBAMATES

Erwin Nikles, Liestal, and Volker Dittrich and Ladislaus Pinter, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation of application Ser. No. 2,445, Jan. 12, 1970, which is a continuation-in-part of application Ser. No. 728,835, May 13, 1968, which in turn is a division of application Ser. No. 493,256, Oct. 5, 1965, all now abandoned. This application Nov. 10, 1971, Ser. No. 197,474
Claims priority, application Switzerland, Oct. 8, 1964, 13,113/64
Int. Cl. A61k *27/00*; C07d *13/04, 89/06*
U.S. Cl. 260—327 U 10 Claims

O-phenylcarbamates, e.g. those of the formula



R_1=H, alkyl or alkenyl
R_2=alkyl or alkenyl
$R_{3,4}$=alkyl, alkenyl, alkynyl
R_3+R_4=alkylene or alkenylene
$X_{1,2}$=H, aliphatic radical, halogen or nitro
X_3=O or S

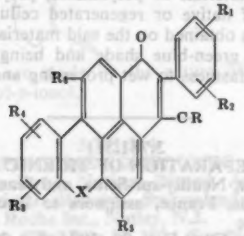
are biocides, e.g. insecticides.

3,781,302
BENZOXANETHENE AND BENZOTHIOXANTHENE DYESTUFFS

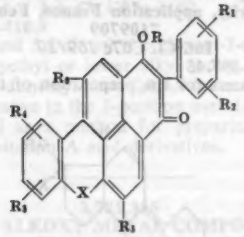
Otto Fuchs, Frankfurt am Main, Ernst Spietschka, Oberauroff, Taunus, Jürgen Hohn Kelsterbach, and Helmut Tröster, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 20, 1971, Ser. No. 145,510
Claims priority, application Germany, May 23, 1970, P 20 25 291.9
Int. Cl. C07d *7/42, 65/16*
U.S. Cl. 260—328 6 Claims

Mixtures of isomers of benzoxanthene or benzothioxanthene dyestuffs of the general formulate



(1)



(2)

wherein X is oxygen or sulfur, R an optionally substituted alkyl group, an acyl or arylsulfonyl group, R_1 and R_2 are hydrogen or halogen atoms, alkyl, aryl, acyl, acyloxy, carbalkoxy, alkoxy, nitro, alkylthio or alkylsolfonyl groups or they form together a condensed benzene ring, R_3 and R_4 are hydrogen or halogen atoms, alkyl, alkoxy, aryl, carbalkoxy or nitrile groups, R_5 and R_6 represent hydrogen or optionally substituted alkoxy groups, and a process for preparing them. The dyestuffs are very suitable for the dyeing of synthetic materials, especially for the dyeing of polyethyleneglycol terephthalate. Moreover, these dyestuffs may be used as fluorescent dyestuffs in the mass dyeings of synthetic polymers. The resulting dyeings are distinguished by a good fastness to light, wet processing and thermofixation.

3,781,303
METHOD OF PREPARING TRICYCLOHEXYLIDENE PEROXIDE

Paul R. Story and Peter Busch, Athens, Ga., assignors to Story Chemical Corporation

No Drawing. Filed June 29, 1970, Ser. No. 50,963
Int. Cl. C07d *19/00*
U.S. Cl. 260—338 1 Claim

A method for the preparation of mixed tricyclohexylidene peroxide and dicyclohexylidene peroxide or dicyclohexylidene peroxide alone comprising reacting a peroxide selected from the group consisting of 1-hydroperoxy 1'-hydroxydicyclohexyl peroxide and 1,1'-dihydroperoxydicyclohexyl peroxide with an organic solvent and a strong acid catalyst. Another method is disclosed for the preparation of tricyclohexylidene peroxide and dicyclohexylidene peroxide or tricyclohexylidene alone comprising reacting a peroxide selected from the group consisting of 1-hydroperoxy 1'-hydroxydicyclohexyl peroxide and 1,1'-dihydroperoxydicyclohexyl peroxide with a liquid carboxylic acid and strong acid catalyst. Also disclosed are new and useful improvements in the method for the preparation of 1-hydroperoxy-1'-hydroxydicyclohexyl peroxide comprising reacting cyclohexanone with aqueous hydrogen peroxide and a strong acid catalyst.

3,781,304
PRODUCTION OF TRIOXANE

Hugo Fuchs and Albrecht Hilt, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Jan. 24, 1972, Ser. No. 220,375
Int. Cl. C07d *19/00*
U.S. Cl. 260—340 4 Claims

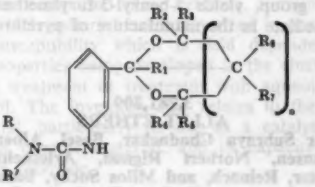
Production of trioxane from aqueous formaldehyde solutions in the presence of mixtures of boric acid and phosphoric acid as acid catalysts.

3,781,305
SUBSTITUTED UREIDO DIOXOLANES AND DIOXANES AND THEIR UTILITY AS HERBICIDES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,316
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 52 Claims

Substituted ureido dioxolanes and dioxane compounds having the formula



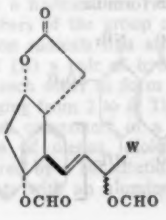
in which R is lower alkyl, R' is selected from the group consisting of lower alkyl and hydrogen; R_1, R_2, R_3, R_4, R_5 and R_7 each are independently selected from the group consisting of hydrogen and lower alkyl; R_6 is selected from the group consisting of lower alkyl, haloalkyl, hydrogen, hydroxymethyl, lower alkoxy carbonyloxymethyl, N-lower alkyl carbamoyloxymethyl and S-lower alkylthiocarbonyloxymethyl; and *n* is 0 or 1. These compounds are useful as herbicides.

3,781,306
BICYCLIC LACTONE DIFORMATE

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Application Sept. 16, 1971, Ser. No. 181,246, now Patent No. 3,711,515, which is a continuation-in-part of abandoned application Ser. No. 93,483, Nov. 27, 1970. Divided and this application Dec. 15, 1972, Ser. No. 315,366
Int. Cl. C09d *5/32*
U.S. Cl. 260—343.3 4 Claims

Process for preparing bicyclic lactone diol diformates of the formula



wherein W is 1-pentyl, cis 1-pent-2-enyl or 1-pent-2-ynyl. The lactone diol diformates are useful intermediates in preparing prostalglandins having pharmacological utility.

3,781,307
RUTHENIUM CATALYZED PROCESS FOR THE ALKYLATION OF KETONES

Pierre Chabardes and Yvon Querou, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,162
Claims priority, application France, Aug. 12, 1969; 162,770
Int. Cl. C07c *49/06*; C07d *5/16*
U.S. Cl. 260—347.8 **11 Claims**

Primary alcohols condense with ketones containing at least one alpha hydrogen atom in the presence of a basic compound and a catalyst based on a noble metal of Group VIII of the Periodic Table to give higher ketones.

3,781,308
PREPARATION OF 5-BENZYL-3-FURYLMETHANOL

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed July 3, 1972, Ser. No. 268,306
Int. Cl. C07d *5/20, 5/26*
U.S. Cl. 260—347.8 **2 Claims**

Thermal condensation of 5-benzylfuran with an alkyl propiolate to form an intermediate bicyclic compound which, by reverse reaction and subsequent reduction of the ester group, yields 5-benzyl-3-furylmethanol, useful as intermediate in the manufacture of pyrethroid insecticides.

3,781,309
ALLYL ETHERS

Madhukar Subraya Chodnekar, Basel, Albert Pfiffner, Pfaffhausen, Norbert Rigassi, Arlesheim, Ulrich Schwieter, Reinach, and Milos Suchy, Basel, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

No Drawing. Filed Jan. 21, 1971, Ser. No. 108,599
Int. Cl. C07d *1/18*
U.S. Cl. 260—348 R **8 Claims**

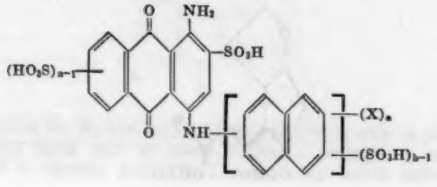
Allyl ethers or esters of aliphatic alcohols or acids wherein the aliphatic chain contains an epoxide group and at least 7 carbon atoms. The ethers and esters are useful in killing and preventing the proliferation of insects by upsetting their hormonal balance.

3,781,310
WATER-SOLUBLE ANTHRAQUINONE DYESTUFFS

Fritz Meininger and Hartmut Springer, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,656
Claims priority, application Germany, Oct. 24, 1969, P 19 53 600.6
Int. Cl. C09b *1/34*
U.S. Cl. 260—374 **5 Claims**

A water-soluble anthraquinone dyestuff having in form of the free acid the formula



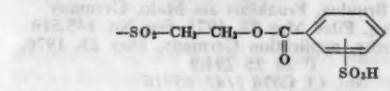
in which X represents $-SO_2-CH=CH_2$,

$-SO_2-CH_2-CH_2-OH$,

$-SO_2-CH_2-CH_2-O-SO_3H$,

$-SO_2-CH_2-CH_2-S-SO_3H$,

$-SO_2-CH_2-CH_2-O-PO_3H_2$,



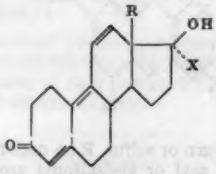
or $-SO_2-CH_2-CH_2-N$ (lower alkyl)$_3$, n is 1, 2 or 3, a is 1 or 2 and b is 1, 2, or 3, said dyestuffs being highly suitable for the dyeing or printing of leather, wool, silk, fibrous materials of polyamides, polyurethanes and particularly of native or regenerated cellulose, the dyeings and prints obtained on the said materials showing intense blue to green-blue shade and being distinguished by very good fastness to wet processing and a good fastness to light.

3,781,311
NOVEL PREPARATION OF TRIENIC STEROIDS

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, France, assignors to Roussel UCLAF, Paris, France

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,731
Claims priority, application France, Feb. 19, 1971, 7109709
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.45 **6 Claims**

A novel process for the preparation of trienic steroids of the formula



(I)

wherein R is alkyl of 1 to 4 carbon atoms and X is selected from the group consisting of aliphatic of 1 to 6 carbon atoms optionally substituted and cycloalkyl of 3 to 6 carbon atoms and to novel intermediates for the said process.

3,781,312
PROCESS FOR PREPARING 3-HYDROXY-9α-HYDROGEN - 11α - HYDROXY-RING A-AROMATIC STEROIDS

Gordon Hanley Phillipps, Wembley, and John Peter Turnbull, London, England, assignors to Glaxo Laboratories Limited, Greenford, England

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,177
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.45 **13 Claims**

3-hydroxy-9α-hydrogen - 11α-hydroxy-ring A-aromatic steroids are prepared by reducing a 3-hydroxy- or -acyloxy-9α-hydroxy-11β-nitro-oxy-ring A-aromatic steroid with a borohydride reducing agent such as sodium or potassium borohydride.

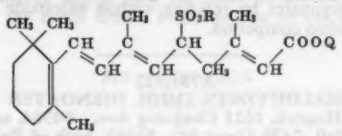
3,781,313
SULFONE INTERMEDIATES FOR THE SYNTHESIS OF VITAMIN A

Marc Julia, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France

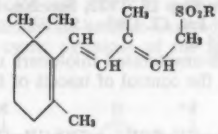
Claims priority, application France, Jan. 20, 1971, 7101792
Int. Cl. C07c *143/90*
U.S. Cl. 260—402 **8 Claims**

Vitamin A acid and its esters, which are known inter-

mediates for the production of vitamin A, are made by the action of alkali on sulphones of the formula:



where R is an aryl radical and Q is hydrogen or an organic radical, themselves made by reaction of γ-halogenosenecioates on sulphones of formula:



which in turn are made by the action of an aryl sulphinate on vinyl-β-ionol.

3,781,314

POLYENE COMPOUNDS

Werner Bollag, Basel, Norbert Rigassi, Arlesheim, and Ulrich Schwieter, Reinach, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

No Drawing. Filed July 14, 1971, Ser. No. 162,598

Int. Cl. C07c *3/02*

U.S. Cl. 260—410.9 **8 Claims**

The compound 5,5-dimethyl-cyclopent-1-ene having an acetyl, hydroxyethyl or lower alkyl group in the 2-position and 3,7-dimethyl-nona-2,4,6,8-tetraenoic acid or tetraenol derivative in the 1-position useful as anti-tumor agents as well as a method for preparing these compounds from vitamin A acid derivatives.

3,781,315

HALO ALKOXY METAL COMPOUNDS

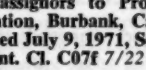
Anthony E. Pepe, Hacienda Heights, and Hakam Singh, Newhall, Calif., assignors to Products Research & Chemical Corporation, Burbank, Calif.

No Drawing. Filed July 9, 1971, Ser. No. 161,920

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **10 Claims**

Tin and titanium compounds containing, as the functional group, the radical



in which M is tin or titanium and X is chlorine or bromine, said compounds being useful as catalysts for curing polysiloxane, polyurethane, and epoxy polymers. There is also disclosed a method for making such organometallic compounds which includes the step of reacting tin or titanium compounds having from 1 to 4 chlorine or bromine atoms with epoxy organic compounds.

3,781,316

TRI-2-NORBORNYLTIN COMPOUNDS

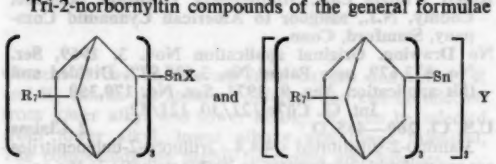
Melvin H. Gitlitz, Edison, N.J., assignor to M&T Chemicals Inc., Greenwich, Conn.

No Drawing. Filed Dec. 18, 1972, Ser. No. 316,045

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **5 Claims**

Tri-2-norbornyltin compounds of the general formulae



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effectively combat fungi and mites when applied to objects, particularly plants, that are susceptible to attack by these organisms. The present compounds are particularly advantageous in that they are non-phytotoxic and therefore will not damage plants to which they are applied. In the foregoing formulae each R^1 is individually selected from hydrogen and lower alkyl radicals, X is a chlorine, bromine, fluorine, hydroxyl, carboxylate, phenoxy, alkoxy (—OR^2) or mercaptide (—SR^2) radical wherein R^2 represents an alkyl or aryl radical containing between 1 and 12 carbon atoms, inclusive and Y is an oxygen, sulfur, or a sulfate radical.

3,781,317

SILVER KETENIDE AND PREPARATION THEREOF

Derek Bryce-Smith, Highland Wood House, Mill Lane, Kidmore End, and Ernest Thomson Blues, 36 Reeds Ave., Earley, Reading, England

No Drawing. Original application Mar. 20, 1970, Ser. No. 21,529, now Patent No. 3,647,720. Divided and this application Nov. 24, 1971, Ser. No. 202,018

Int. Cl. C07f *1/10*

U.S. Cl. 260—430 **8 Claims**

The invention relates to material containing a new form of silver referred to as cluster silver in which the atoms are arranged in a lattice different from the face-centred configuration of conventional silver, and in particular to silver metal, silver compounds, silver complexes and to a new compound silver ketenide, containing cluster silver, which material is characterized in possessing a magnetic susceptibility which is field dependent, such magnetic properties being developed in the cluster silver by thermal treatment or treatment with aqueous media or methanol. The invention also relates to the uses of such material, particularly its use as a catalyst in the oxidation of organic material, and its capacity to generate carbon suboxide.

3,781,318

NOVEL DIAMIDODIALANES AND PROCESS FOR THE PREPARATION THEREOF

Margherita Corbellini, Milan, and Agostino Balducci, San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

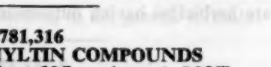
No Drawing. Filed Mar. 10, 1971, Ser. No. 123,052

Claims priority, application Italy, Mar. 11, 1970, 21,750/70

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 R **10 Claims**

A new class of diamidodialanes, represented by the formula:



wherein X is hydrogen, halogen or a secondary amine radical; each R is a hydrocarbon radical and said R's, together, are members of the group consisting of (a) a pair of hydrocarbon radicals that are unlinked directly to each other, and (b) a pair of hydrocarbons that are linked directly to each other to form a ring; and *n* is a whole number ranging from 2 to 6. The respective members are useful as a component of a catalyst system in the polymerization of olefins, diolefins and polyenes, and may be prepared by a substitution reaction of a diamine chlorohydrate with an aluminum hydride.

3,781,319
PROCESS FOR PREPARING ISOCYANATES

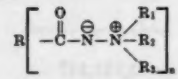
Stanely Wawzonek, Iowa City, Iowa, and Richard C. Gueldner, Starkville, Miss., assignors to State of Iowa, University of Iowa, Iowa City, Iowa

No Drawing. Continuation-in-part of application Ser. No. 839,650, July 7, 1969, which is a continuation-in-part of abandoned application Ser. No. 482,941, Aug. 26, 1965. This application Sept. 28, 1970, Ser. No. 76,327

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 P **16 Claims**

Isocyanates are prepared by pyrolyzing an aminimide having the formula



wherein R_1, R_2 and R_3 are alkyl, aryl and radicals in which R_2 and R_3 are joined to form a heterocyclic ring, R is an aliphatic, cycloaliphatic or aromatic group and *n* is an integer of at least 1, usually 1 to 4.

3,781,320
PROCESS FOR MANUFACTURE OF ORGANIC ISOCYANATES

Carl F. Irwin, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 846,210, July 30, 1969, which is a continuation-in-part of abandoned application Ser. No. 687,293, Dec. 1, 1967. This application Feb. 9, 1971, Ser. No. 113,939

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PH **22 Claims**

Organic isocyanate compounds can be prepared with surprising efficiency by (a) continuously feeding to a suitable high-shear reaction zone an amine solution and a phosgene/isocyanate solution in specified proportions; (b) mixing the solutions under certain conditions of shear, pressure, and temperature while continuously moving them through the high-shear reaction zone until substantially all the amine has reacted with the mixture; (c) continuously removing the mixed and reacted material from the reaction zone (followed if desired by allowing the material to undergo further reaction while flowing to an isocyanate isolation means and/or recycling through the high-shear reaction zone); and (d) isolating isocyanate compound from the resulting material. An apparatus having beneficial utility in carrying out this process comprises a mixer which provides not only the inlet and outlet characteristics needed for a fast and efficient operation, but also an annular high-shear mixing zone formed between the tubular inner wall of a cylindrical vessel and the outer ends of the blades of a coaxial rotor rotating therein.

3,781,321
PREPARATION OF AROMATIC ISOCYANATES

Thomas J. Hurley, Jr., Madison, and Martin A. Robinson, Orange, Conn., assignors to Olin Corporation, New Haven, Conn.

No Drawing. Original application June 21, 1968, Ser. No. 738,829, now Patent No. 3,654,279. Divided and this application May 12, 1971, Ser. No. 143,171

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PC **4 Claims**

A new composition of matter having the formula

$$PdL(CO)X_2$$

where L is a Lewis base and where X is a halogen. This composition is prepared by reacting carbon monoxide with a Lewis base and a palladium-containing material selected from the group consisting of

(a) palladium dihalide
(b) a mixture of elemental palladium with an acid halide, and
(c) mixtures thereof,

in the presence of a liquid reaction medium. The resulting complex is useful as a catalyst in the preparation of organic isocyanates by reacting carbon monoxide with an organic nitro compound.

3,781,322
HALOHYDRIN THIOL DIENOATES

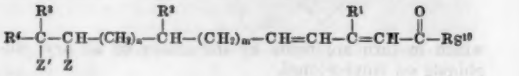
Clive A. Henrick, 1621 Channing Ave. 94304, and John B. Siddall, 2470 Greer St. 94303, both of Palo Alto, Calif.

No Drawing. Original application Feb. 16, 1971, Ser. No. 115,725, now Patent No. 3,706,733. Divided and this application Aug. 18, 1972, Ser. No. 281,887

Int. Cl. C07c *153/07*

U.S. Cl. 260—455 R **10 Claims**

Aliphatic 2,4-di-unsaturated thiolesters useful as intermediates and for the control of insects of the formula:



wherein:

m is zero or the positive integer one, two or three;
n is the positive integer one, two or three;
Z is bromo, chloro, fluoro or hydroxy;
Z′ is bromo, chloro, fluoro or hydroxy; and
R^{10} is lower alkyl, provided that when Z′ is bromo, chloro or fluoro, then Z is hydroxy and when Z′ is hydroxy, then Z is bromo, chloro or fluoro R′=hydrogen or lower alkyl and R^2, R^3, R^4 are lower alkyl.

3,781,323
CYANO- AND TRIFLUOROMETHYL-SUBSTITUTED 6-NITROANILINES

Klaus Wagner and Ludwig Eue, Cologne, and Erich Klauke, Odenthal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

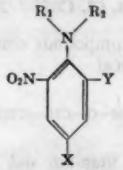
No Drawing. Filed Feb. 9, 1971, Ser. No. 114,071

Claims priority, application Germany, Feb. 28, 1970, P 20 09 497.7

Int. Cl. C07c *121/78*

U.S. Cl. 260—465 E **20 Claims**

Novel 6-nitroaniline compounds of the formula



in which

R_1 is hydrogen, substituted or unsubstituted alkyl or aryl, or cycloalkyl;
R_2 is hydrogen, alkyl or alkenyl; and
R_1 and R_2 together can form a heterocycle; and of X and Y one is cyano and the other trifluoromethyl

are herbicides having outstanding activity and selectivity.

3,781,324
CERTAIN 6-TRIFLUOROMETHYLCYTOSINES AND THIOCYTOSINES, THEIR SYNTHESIS, AND THEIR USE IN THE SYNTHESIS OF URACILS AND THIOURACILS

Albert William Lutz, Montgomery Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

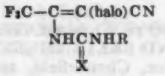
No Drawing. Original application Nov. 3, 1969, Ser. No. 873,679, now Patent No. 3,635,977. Divided and this application Aug. 9, 1971, Ser. No. 170,350

Int. Cl. C07c *121/30, 121/52*

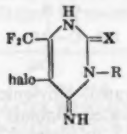
U.S. Cl. 260—465 D **2 Claims**

3-amino-2-substituted - 4,4,4 - trifluoro-2-butenenitriles are reacted with isocyanates or isothiocyanates in the pres-

ence of an inert solvent and from 0.75 to about 1.0 mole equivalents of strong base per mole of butenenitrile to produce the novel ureido butenenitriles of the formula:



wherein R is alkyl, alkenyl, phenyl, benzyl and substituted derivatives thereof and X is sulfur or oxygen. The ureido butenenitriles are treated with additional base to produce novel cyclic cytosines of the formula:



wherein R and X are as defined above. The cytosines can be produced directly by treating 3-amino-2-substituted-4,4,4-trifluoro-2-butenenitrile with at least 1.0 mole equivalent of base. The novel compounds are useful intermediates in the preparation of herbicidal uracils and thiouracils.

3,781,325

15-METHOXY-PGF$_{2\alpha}$

Frank H. Lincoln, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed May 4, 1971, Ser. No. 140,252

Int. Cl. C07c *61/32, 69/74*

U.S. Cl. 260—468 D **4 Claims**

Prostaglandin E_2-type and $F_{2\alpha}$-type compounds with a methoxy group replacing the hydroxyl at the C–15 position are disclosed. These are useful for the same pharmacological purposes as the unsubstituted prostaglandins.

3,781,326

PHOSPHORYLATED THIOUREA COMPOSITIONS

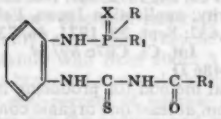
Alexander Mihailovski, 1812 Delaware St., Berkeley, Calif. 94703, and Don R. Baker, 15 Muth Drive, Orinda, Calif. 94563

No Drawing. Original application Dec. 29, 1971, Ser. No. 213,714. Divided and this application Feb. 26, 1973, Ser. No. 336,111

Int. Cl. C07f *9/22*

U.S. Cl. 260—470 **3 Claims**

New compounds corresponding to the generic formula:



wherein X can be selected from oxygen and sulfur, R and R_1 can be the same or different and can be selected from lower alkyl and lower alkoxy, R_2 can be selected from lower alkyl, lower alkoxy and lower thioalkyl. The compounds are useful fungicides and biocides.

3,781,327

META-CARBANILATE ETHERS

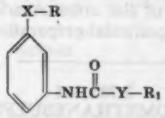
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,004

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **13 Claims**

Meta-carbanilate ethers and sulfides having the formula



in which X is oxygen or sulfur; Y is oxygen or sulfur; R is branched and straight chain alkyl, alkenyl, vinyloxyalkyl, ketoalkyl, or alkylthioalkyl; and R_1 is alkyl or alkenyl. The compounds of this invention are useful as herbicides.

3,781,328

PHENOXY-ALKYL-CARBOXYLIC ACID COMPOUNDS

Ernst-Christian Witte, Mannheim, Kurt Stach, Mannheim-Waldhoe, Max Thiel, Mannheim, Felix Helmut Schmidt, Mannheim-Seckenheim, and Harald Stork, Mannheim-Feudenheim, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

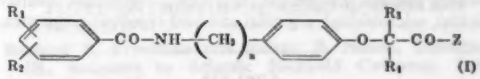
No Drawing. Filed Sept. 7, 1972, Ser. No. 287,114

Claims priority, application Germany, Oct. 1, 1971, P 21 49 070.0; June 22, 1972, P 22 30 383.9

Int. Cl. C07c *103/30*

U.S. Cl. 260—471 R **23 Claims**

Novel phenoxy-alkyl-carboxylic acid compounds of the formula:



wherein

R_1 and R_2, which may be the same or different, are hydrogen, halogen, lower alkyl or lower alkoxy;

R_3 and R_4, which may be the same or different, are hydrogen or lower alkyl;

n is 1, 2 or 3; and Z is hydroxyl or lower alkoxy;

and the pharmacologically compatible salts thereof, are remarkably effective in lowering the serum lipid level and cholesterol level without inducing undesirable side effects.

3,781,329

ELECTRONEGATIVELY SUBSTITUTED CARBOXYPHENYL OXALATES AS SUPERIOR CHEMILUMINESCENT MATERIALS

Laszlo Joseph Bollyky, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Dec. 18, 1969, Ser. No. 886,406, now abandoned. Divided and this application Dec. 23, 1971, Ser. No. 211,809

Int. Cl. C07c *69/36*

U.S. Cl. 260—479 S **4 Claims**

New compounds which are reactive with hydrogen peroxide in the presence of a solvent and a fluorescer to produce visible chemiluminescent light. The light capacity of the electronegatively substituted carboxyphenyl oxalate reaction is superior to that of the similarly electronegatively substituted phenyl oxalate reaction.

3,781,330

ORTHOAMINOPHENYL-N-METHYLCARBAMATES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,215
Claims priority, application Switzerland, Oct. 31, 1969, 16,282
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C 4 Claims

N-monosubstituted o-aminophenylcarbamates are effective against pests, in particular against insects, nematodes and representatives of the order Acarina. They may be used in the form of pesticidal preparations.

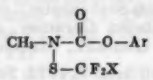
3,781,331

N-TRIHALOMETHANESULFENYL-N-METHYL-CARBAMATES

Engelbert Kühle, Bergisch Gladbach, Erich Klauke, Odenthal-Hahnenberg, Wolfgang Behrenz, Cologne, and Paul Ernst Frohberger, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 13, 1971, Ser. No. 171,746
Claims priority, application Germany, Aug. 20, 1970, P 20 41 322.3
Int. Cl. C07c *149/24*
U.S. Cl. 260—479 C 7 Claims

N-trihalomethanesulfenyl-N-methyl-carbamates of the general formula



(I)

in which

X is chlorine or fluorine, and

Ar is a phenyl or naphthyl radical optionally substituted by at least one lower alkyl, alkoxy, alkylmercapto, dialkylamino, trifluormethyl, halogen or nitro radical,

which possess insecticidal, acaricidal, fungicidal, bactericidal, microbicidal, algicidal and bird-repellent properties.

3,781,332

PROCESS FOR THE EXTRACTION OF METHACRYLIC ACID FROM AQUEOUS SOLUTIONS

Ryozi Sato, Takaoka, and Yasuyoshi Chino, Tokyo, Japan, assignors to Nippon Zeon Co., Ltd.

Filed Dec. 23, 1971, Ser. No. 211,416
Claims priority, application Japan, Dec. 28, 1970, 45/119,626
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 14 Claims

A process for separating methacrylic acid from an aqueous solution by use of an extraction solvent composed of methyl or ethyl methacrylate and not more than 50% of xylene, ethyl benzene or a mixture thereof.

3,781,333

BETA,BETA-DIMETHYL ACRYLATES

Heinrich Kappeler, Wurenlos, and Jost Wild, Zurich, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Original application Dec. 23, 1968, Ser. No. 786,413, now Patent No. 3,700,717. Divided and this application Aug. 23, 1972, Ser. No. 283,005
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 1 Claim

A synthetic process for producing lavandulol (III) and lavandulyl acetate (V) economically and in pure form is disclosed. This is accomplished by a novel process involving making lavandulic acid (II by the rearrangement of a novel compound, 2-methyl-buten-2-yl-β,β-dimethyl acrylate (I). The lavandulic acid so formed may be reduced to lavandulol (III) or lavandulal (IV), converted into a lower alkyl ester (V) or into the novel lavandulic acid nitrile (VI). Lavandulol (III) may be transformed into the novel lavandulyl β,β-dimethyl acrylate (VII).

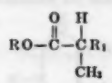
3,781,334

ALKYL LACTOYL FUMARATES, MALEATES AND SALTS THEREOF

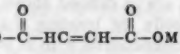
Thomas P. Kichline, Chesterfield, and James F. Conn, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Sept. 13, 1968, Ser. No. 759,796, now Patent No. 3,582,354. Divided and this application Oct. 28, 1970, Ser. No. 84,900
Int. Cl. C07c *69/68*
U.S. Cl. 260—484 A 4 Claims

Novel compounds having the following formula:



wherein R is a saturated, ethylenically unsaturated, or diethylenically unsaturated aliphatic hydrocarbon radical having from about 12 to about 22 carbon atoms and R_1 is a radical having the following formula:



wherein M is H, alkali metal, alkaline earth metal or ammonium are useful as emulsifiers in bakery products.

3,781,335

PREPARATION OF DIFLUORONITROETHYL-PERFLUORO ACRYLATE AND RELATED COMPOUNDS

Leonard O. Ross, Sunnyvale, and Marion E. Hill, Palo Alto, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 11, 1972, Ser. No. 217,042
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 H 6 Claims

Perfluoroacrylyl chloride is reacted with 2,2,2-difluoronitroethanol under basic catalytic conditions to produce 2,2,2-difluoronitroethylperfluoro acrylate with

$$NO_2CF_2CH_2OCF_2CFHCOCl$$

Under acidic catalytic conditions the terminal fluorine is replaced giving ClCF=CFCOCl with ester and alcohol adduct products. The use of reduced pressure was found necessary in the production of the initial acid chloride reagent. Other related derivatives are described.

3,781,336

METHOD FOR PRODUCING METHACRYLIC ACID AND ITS ESTERS

Masazumi Chono, Oimachi, and Hitoshi Nakajima, Masayoshi Taguchi, and Noriaki Matsuo, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 24, 1972, Ser. No. 229,110
Claims priority, application Japan, Feb. 24, 1971, 46/8,632; Sept. 23, 1971, 46/73,793
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 D 7 Claims

An economical method for producing methacrylic acid and its esters from at least one organic compound selected from the group consisting of isobutyric acid and its esters by the dehydrogenation reaction with sulfur is provided. This method comprises adding said organic compound to the reaction system together with 0.3–70.0 gram atoms of sulfur vapour and as a catalyst, 0.5–30.0 mols of hydrogen sulfide per one mol of said organic compound at a temperature in the range of 400°–560° C.

3,781,337

ELIMINATING CARBON DIOXIDE FROM FORMYLOXYALKYNES

Walter Himmele, Walldorf, Werner Fliege, Otterstadt, and Helmut Froehlich, Karlsruhe, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 3, 1971, Ser. No. 204,731
Int. Cl. C07c *1/20, 67/00*
U.S. Cl. 260—491 12 Claims

A process for the catalytic elimination of carbon dioxide from formyloxyalkynes which bear a formyloxy group on at least one of the carbon atoms in the α-position to the triple bond. The process is important for example for the production of alkynyl formates such as 2-butyn-1-yl formate, 2-pentyn-1-yl formate and 3-hexyn-2-yl formate from the corresponding alkynediol diformate and for the production of alkynes and allenes from alkynediol diformates or alkynyl formates.

3,781,338

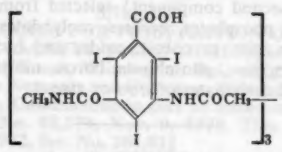
NITRILOTRIACYLTRIIMINO-TRIS-(2,4,6-TRIIODOBENZOIC ACID) COMPOUNDS

Philip E. Wiegert, St. Louis County, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 780,296, Nov. 29, 1968. This application Feb. 8, 1971, Ser. No. 113,630
Int. Cl. C07c *101/26*
U.S. Cl. 260—501.11 10 Claims

Nitrilotriacyltriimino - tris - (2,4,6-triiodobenzoic acid) compounds are useful as X-ray contrast agents. Solutions of their water-soluble salts are less hypertonic than conventional aqueous vasographic media of equivalent iodine content.

A typical symmetrical member of the series has the following structure:



(I)

3,781,339

SULFONATE MIXTURES BASED ON DERIVATIVES OF OLEFINS OF THE VINYL, VINYLIDENE AND INTERNAL TYPES HAVING FROM 12 TO 16 CARBON ATOMS PER MOLECULE

Melvin E. Tuvell and William J. Dewitt, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1970, Ser. No. 85,838
Int. Cl. C07c *143/04, 143/10, 143/16*
U.S. Cl. 260—513 R 7 Claims

It is disclosed that olefin sulfonates obtained by saponifying the reaction product of SO_3 and olefins having from about 12 to about 16 carbon atoms per molecule provide excellent hard water detergent materials when the olefins are predominantly unbranched acyclic terminal monoolefins in admixture with from about 3 to about 30 mol percent of beta-branched terminal olefins and from about 3 to about 12 mol percent of internal olefins. Preferred olefin sulfonates are the sodium and potassium salts of alkene sulfonic acids and of hydroxy alkane sulfonic acids. The mixtures of the present invention involve sulfonates with from about 64 to about 97 percent C_{16}, from zero to about 15 percent C_{14} and from about 3 to about 33 percent C_{12} carbon atoms per molecule, in percent by weight.

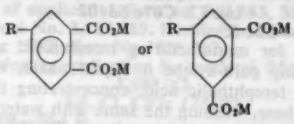
3,781,340

ALKYL PHTHALIC ACID COMPOUNDS

Stephen E. McGuire, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,035
Int. Cl. C07c *63/16, 63/20, 63/24*
U.S. Cl. 260—515 P 4 Claims

Novel surface active agents are provided having the general formula:



wherein R is a tertiary alkyl group containing from about 8 to about 16 carbon atoms and M is a cation selected from the group consisting of Li, Na, K, Rb, Cs, Ca, Mg, NH_4 and substituted ammonium.

3,781,341

DISPROPORTIONATION OF ALKALI METAL SALTS OF AROMATIC CARBOXYLIC ACIDS

Yu-Lin Wu and Paul S. Hudson, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed June 25, 1971, Ser. No. 156,984
Int. Cl. C07c *63/14, 63/26*
U.S. Cl. 260—515 P 6 Claims

A slurry comprised of an alkali metal salt of an aromatic carboxylic acid, a disproportionation catalyst, and an inert high-boiling organic dispersant is subjected to heating at an elevated temperature in the presence of a gas atmosphere to form a polycarboxylate having at least one additional carboxyl group.

3,781,342

PRODUCTION OF TERTIARY ALKYL SUBSTITUTED ORTHO-TOLUIC ACIDS AND ESTERS THEREOF

Bernard S. Friedman and Steven B. Nason, Chicago, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

No Drawing. Filed Mar. 14, 1973, Ser. No. 340,990
Int. Cl. C07c *63/04*
U.S. Cl. 260—515 R 9 Claims

Preparation of tertiary alkyl derivatives of ortho-toluic acid and the lower alkyl esters thereof is accomplished by carbonylating a branched olefin with carbon monoxide in the presence of a mineral acid catalyst and heating the resulting carbonylate and the ortho-toluic acid or lower alkyl ester thereof to obtain carbon monoxide and a tertiary alkyl derivative of ortho-toluic acid or ester thereof.

3,781,343

HYDROLYSIS OF AROMATIC DINITRILES

Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., St. Davids, Pa.

No Drawing. Filed Apr. 12, 1973, Ser. No. 350,433
Int. Cl. C07c *63/00, 63/26*
U.S. Cl. 260—515 P 4 Claims

A process for the preparation of an aromatic acid such as terephthalic acid by hydrolysis of terephthalonitrile which comprises subjecting terephthalonitrile to aqueous hydrolysis in a closed reactor at 200° C. to 300° C. until a hydrolysis equilibrium is obtained, venting the closed system to remove more than 50% of available, ammonia, adjusting the venter system to a molality of terephthalate from 1.5 to 2.5, saturating the system with carbon dioxide, and isolating the precipitated terephthalic acid by separation under a pressure of about 50 to about 900 p.s.i.g.

3,781,344

PROCESS FOR MANUFACTURING TEREPHTHALIC ACID BY OXIDATION OF PARA-XYLENE

Jacob Alagy, La Celle-St.-Cloud, and Christian Busson, Rueil-Malmaison, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed May 1, 1972, Ser. No. 248,803
Claims priority, application France, May 6, 1971, 7116492
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 9 Claims

A process for manufacturing terephthalic acid comprises oxidizing para-xylene in liquid phase, recovering the resulting terephthalic acid, concentrating the recovered liquid phase, washing the same with water, separating the solid by-products from the liquid phase and recycling the liquid phase to the oxidation reactor.

The process may be used over long periods without a substantial yield decrease.

3,781,345

METHOD OF PREPARING 2,4-DIMETHYL-ISOPHTHALIC ACID

Philmore M. Scudder, Havertown, Pa., and Robert W. Warren, Pitman, N.J., assignors to Sun Research and Development Co., Philadelphia, Pa.

Filed Feb. 24, 1971, Ser. No. 118,376
Int. Cl. C07c *63/02, 63/14*
U.S. Cl. 260—524 R 1 Claim

2,4-dimethylisophthalic acid, its esters and a process for preparing the acid by partial oxidation of prehnitene with aqueous permanganate.

3,781,346

PROCESS FOR PURIFICATION OF NAPHTHALENE CARBOXYLIC ACIDS

Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed May 25, 1972, Ser. No. 257,026
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 5 Claims

A process for the purification of naphthalene carboxylic acids containing an aldehyde impurity which comprises heating a solid ammonium salt of said acid while sweeping said solid salt with steam.

3,781,347

PROCESS FOR PURIFICATION OF TEREPHTHALIC ACID

Richard V. Norton, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed May 25, 1972, Ser. No. 257,027
Int. Cl. C07c *51/42*
U.S. Cl. 260—525 5 Claims

A process for the purification of terephthalic acid containing an aldehyde impurity which comprises heating a solid ammonium salt of said terephthalic acid at a temperature of from about 200° C. to about 300° C. while sweeping said solid salt with steam.

3,781,348

PROCESS FOR THE PRODUCTION OF THIOCORNINE

Kiyoshi Kominato and Yutaka Kominato, both of 15, Hagigakakiuchicho, Shimokamo Sakyo-ku, Kyoto-shi, Japan

No Drawing. Original application Nov. 4, 1968, Ser. No. 773,294, now Patent No. 3,626,003. Divided and this application Nov. 6, 1970, Ser. No. 87,608
Claims priority, application Japan, Nov. 8, 1967, 42/71,834
Int. Cl. C07c *101/04*
U.S. Cl. 260—534 S 8 Claims

Thiocornine, an amino acid, and thiamamidine phosphoric cysteine are obtained from vegetable sources, e.g. Allium plants, or animal sources. The compounds are therapeutically useful.

3,781,349

PREPARATION OF POLYGLYCOLIC ACID IN FINELY DIVIDED FORM

Wallace Burton Ramsey, Stamford, and Darwin Fiske De Lapp, New Canaan, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Feb. 25, 1971, Ser. No. 118,974
Int. Cl. C07c *59/12*
U.S. Cl. 260—535 P 9 Claims

This invention relates to a process for producing finely divided polyglycolic acid comprising dissolving said polyglycolic acid in an inert solvent and then adding a nonsolvent for the polyglycolic acid to the solution thereby producing polyglycolic acid particles in finely divided form.

3,781,350

PROCESS FOR PREPARATION OF ω-HYDROXY SATURATED ALIPHATIC MONOCARBOXYLIC ACIDS

Yutaka Fujita, Toshiki Toda, and Tsuneo Shimada, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed July 6, 1972, Ser. No. 269,305
Claims priority, application Japan, July 9, 1971, 46/50,849; Sept. 29, 1971, 46/76,194; Oct. 2, 1971, 46/77,297, 46/77,298; Oct. 30, 1971, 46/86,401
Int. Cl. C07c *59/04*
U.S. Cl. 260—535 R 11 Claims

Saturated aliphatic dicarboxlic acids of 4 to 12 carbon atoms can be converted to the corresponding ω-hydroxy saturated aliphatic monocarboxylic acids in high yields and with high selectivity when they are contacted with hydrogen together with saturated aliphatic glycols of the same number of carbon atoms in the presence of a catalyst comprising (1) metallic cobalt derived by reducing at least one cobalt compound (first component) selected from the group consisting of cobalt oxides, cobalt carbonates and cobalt hydroxides and (2) a metal and/or a metal compound derived by reducing at least one compound (second component) selected from the group consisting of phosphates, borates, molybdates and tungstates of iron, zinc or cobalt, oxides and hydroxides of iron, rhenium, zinc, phosphorus, boron, molybdenum or tungsten, and carbonates of iron or zinc.

3,781,351

PREPARATION OF ALPHA-HYDROYAMIDES

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,157
Int. Cl. C07c *103/16;* C07d *103/26*
U.S. Cl. 260—559 R 15 Claims

Formamide or a substituted formamide is reacted with a carbonyl compound having from 2 to about 12 carbon atoms in a liquid reaction medium containing a ruthenium or osmium catalyst, preferably in complex association with a biphyllic ligand, at a temperature of from 50° to 300° C. to form an alpha-hydroxyamide. A typical process comprises reacting formamide with an excess of benzaldehyde in the liquid phase in the presence of ruthenium trichloride in complex association with triphenylphosphine to produce alpha-hydroxyphenyl acetamide.

3,781,352

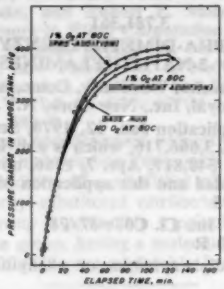
PROCESS FOR PREPARING FORMAMIDE IN THE PRESENCE OF OXYGEN

John O. Hawthorne, Penn Hills Township, Allegheny County, and Samuel B. Schlosberg, Monroeville, Pa., assignors to United States Steel Corporation

Filed Aug. 31, 1971, Ser. No. 176,456
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 R 8 Claims

The addition of oxygen to the carbon monoxide-am-

monia or carbon monoxide-amine reaction system used



to prepare formamides significantly increases the reaction rate.

3,781,353

PROCESS FOR PREPARING 5-LOWER ALKANOYL BENZOPHENONES UTILIZING CERIC SALTS

Robert Ye-Fong Ning, West Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application May 13, 1970, Ser. No. 37,021, now Patent No. 3,627,754. Divided and this application Sept. 8, 1971, Ser. No. 178,802

Int. Cl. C07c *103/42*

U.S. Cl. 260—562 P **5 Claims**

The present invention relates to processes for the preparation of 7-lower alkanoyl-1,4-benzodiazepin-2-ones utilizing ceric salts. The 7-lower alkanoyl benzodiazepin-2-ones are known to be useful as muscle relaxants, sedatives and anticonvulsants.

3,781,354

PROCESS FOR PURIFICATION OF N-ACETYL-P-AMINOPHENOL

John Richard Kosak, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 88,179, Nov. 9, 1970. This application June 12, 1972, Ser. No. 261,811

Int. Cl. C07c *103/38*

U.S. Cl. 260—562 B **2 Claims**

Color exhibiting by-products produced in the acetylation of p-aminophenol to N-acetyl-p-aminophenol are removed from the N-acetyl-p-aminophenol by treating a hot aqueous solution of N-acetyl-p-aminophenol with ferric chloride to oxidize the by-product to the colored state and adsorbing the colored by-product on activated carbon. The activated carbon is then removed and the N-acetyl-p-aminophenol is recovered from the solution.

3,781,355

PESTICIDAL COMPOUNDS AND COMPOSITIONS

Ian Robert Harrison, Bleasby, John Felix McCarthy, Bramcote Hills, and Bryan Harper Palmer, Burton Joyce, England, assignors to Boots Pure Drug Company Limited, Nottingham, England

No Drawing. Continuation-in-part of abandoned application Ser. No. 430, Jan. 2, 1970. This application Dec. 1, 1970, Ser. No. 94,209

Claims priority, application Great Britain, Dec. 12, 1969, 60,793/69; Aug. 26, 1970, 41,120/70

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **7 Claims**

Novel 1,5-diphenyl - 3 - methyl-1,3,5-triazapenta-1,4-dienes, processes for their production and pesticidal, especially acaricidal and insecticidal, compositions and methods are described.

Preferred compounds are particularly active against cattle tick and red spider mite.

3,781,356

BROMOPHENYLFORMAMIDINES

Dieter Duerr, Bottmingen, Hans Aebi, Riehen, and Ludwig Ebner, Stein, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

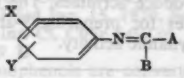
No Drawing. Application Aug. 7, 1969, Ser. No. 864,244, now abandoned, which is a division of application Ser. No. 569,828, Aug. 6, 1966, now Patent No. 3,487,156, which is a continuation-in-part of abandoned application Oct. 8, 1965, Ser. No. 515,772, which in turn is a division of application Ser. No. 262,863, Mar. 5, 1963, now Patent No. 3,284,289. Divided and this application Feb. 22, 1972, Ser. No. 228,327

Claims priority, application Switzerland, Mar. 8, 1962, 2,800/62

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **2 Claims**

Compounds of the formula



in which

X is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy or CF_3,

Y is hydrogen, bromine, lower alkyl, lower alkoxy halophenoxy or CF_3,

A is di-lower-alkylamino, piperidino, pyrrolidino, morpholino, 4-methylpiperazino or hexamethyleneimino, and

B is hydrogen or methyl,

and their salts, are pesticidally effective compounds useful for the control of acarids and insects. Of particular note is the compound in which Y is bromine in the 4-position, X and B are hydrogen, and A is dimethylamino.

3,781,357

ALKYLPHENYL- AND CHLOROPHENOXY-PHENYL-FORMAMIDINES

Dieter Duerr, Bottmingen, Hans Aebi, Riehen, and Ludwig Ebner, Stein, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

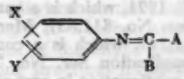
No Drawing. Division of application Ser. No. 864,244, Aug. 7, 1969, now abandoned, which is a division of application Ser. No. 569,828, Aug. 6, 1966, now Patent No. 3,487,156, which is a continuation-in-part of application Ser. No. 515,772, Oct. 8, 1965, now abandoned, which in turn is a division of application Ser. No. 262,863, Mar. 5, 1963, now Patent No. 3,284,289. Divided and this application Feb. 22, 1972, Ser. No. 228,343

Claims priority, application Switzerland, Mar. 8, 1962, 2,800/62

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **5 Claims**

Compounds of the formula



in which

X is hydrogen, chlorine, bromine, lower alkyl, lower alkoxy or CF_3,

Y is hydrogen, bromine, lower alkyl, lower alkoxy halophenoxy or CF_3,

A is di-lower-alkylamino, piperidino, pyrrolidino, morpholino, 4-methylpiperazino or hexamethyleneimino, and

B is hydrogen or methyl,

and their salts, are pesticidally effective compounds useful for the control of acarids and insects. Of particular note are those compounds in which Y is lower alkyl or chlorophenoxy, X and B are hydrogen, and A is dimethylamino.

3,781,358

INTERMEDIATES FOR PREPARING ACRIDINES

Elvin L. Anderson, 246 Nicholson Drive, Moorestown, N.J. 08057, and Harold Graboyes, 1506 Sheffield Lane, Philadelphia, Pa. 19151

No Drawing. Application Feb. 25, 1971, Ser. No. 118,976, now Patent No. 3,692,834, which is a continuation-in-part of application Ser. No. 732,869, May 29, 1968, now Patent No. 3,625,945. Divided and this application June 30, 1972, Ser. No. 267,852

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 B 2 Claims

Diphenyl-2-carboxaldehyde derivatives prepared by reacting a diphenylamine - 2 - carboxylic acid benzenesulfonylhydrazide with a base and hydrazine, semicarbazide, thiosemicarbazide or phenylhydrazine, are reacted with a mineral acid to produce acridines. The acridines are useful as intermediates for preparing 9-aminoalkylacridans having pharmacodynamic activity.

3,781,359

PRODUCTION OF 2-HYDROXY-3,5,6-TRICHLOROBENZYLAMINES

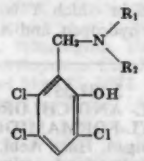
David I. Randall, and Joseph P. Copes, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,364

Int Cl. C07c *87/28*

U.S. Cl. 260—570.9 2 Claims

The invention describes 2-hydroxy-3,5,6-trichlorobenzylamines, having the formula:



Where R_1 and R_2 may each be hydrogen, hydrocarbon groups, substituted hydrocarbon groups or taken together with the nitrogen atom, form a heterocyclic ring, and salts thereof; and novel methods for their synthesis.

They are useful as buffering agents, lubricating oil additives and chemical intermediates and appear to affect enzyme systems.

3,781,360

2-POLYFLUOROLOWERALKYLAMINO BENZOPHENONES

John G. Topliss, West Caldwell, N.J., assignor to Schering Corporation, Bloomfield, N.J.

No Drawing. Continuation-in-part of application Ser. No. 142,051, May 10, 1971, which is a continuation-in-part of application Ser. No. 811,637, Mar. 28, 1969, now Patent No. 3,641,147, which is a continuation-in-part of abandoned application Ser. No. 703,245, Feb. 6, 1968, which is a continuation-in-part of application Ser. No. 650,581, July 3, 1967, now Patent No. 3,429,874, which is a continuation-in-part of application Ser. No. 603,737, Dec. 22, 1966, which in turn is a continuation-in-part of application Ser. No. 520,658, Jan. 14, 1966, both now abandoned. This application May 5, 1972, Ser. No. 250,704

Int. Cl. C07c *97/00*

U.S. Cl. 260—570 AB 6 Claims

This invention relates to 2-polyfluoroloweralkylamino benzophenones of matter useful as intermediates in the preparation of 2-oxo-1,3-dihydro-2H-1,4-benzodiazepines, and the N-N-oxides thereof, having a polyfluoroloweralkyl radical attached at the 1-position thereof and to the methods for making and using such novel chemical intermediates.

3,781,361

N-(4-ALPHA,ALPHA-DIMETHYLBENZYLPHENYL)-1- or -2-NAPHTHYLAMINES

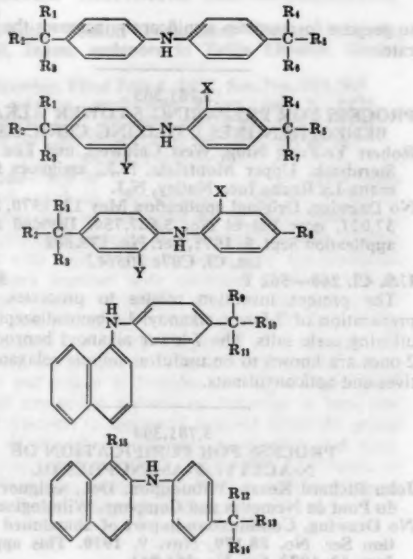
Edward L. Wheeler, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Application Jan. 12, 1970, Ser. No. 2,382, now Patent No. 3,666,716, which is a division of application Ser. No. 540,817, Apr. 7, 1966, now Patent No. 3,505,225. Divided and this application May 22, 1972, Ser. No. 255,495

Int. Cl. C07c *87/28*

U.S. Cl. 260—570 R 3 Claims

Derivatives of diphenylamine or phenylnaphthylamine of the types



where R_1, R_9 and R_{12} are phenyl or p-tolyl groups and the remaining R's, X and Y may be alkyl or various other substituents, are useful antioxidants for lubricating oils or for various polymeric substrates (e.g. polypropylene) especially in combination with a dialkyl thiodipropionate. Typical antioxidants are 4,4'-bis-(alpha,alpha,-p-trimethylbenzyl)diphenylamine made by reacting p,alpha-dimethylstyrene with diphenylamine, and N-(4-alpha,alpha-dimethylbenzylphenyl) - 1 - (alpha,alpha-dimethylbenzyl)-2-naphthylamine made by reacting alpha-methylstyrene with N-phenyl-2-naphthylamine.

3,781,362

REMOVAL OF 1,2-DIAMINOCYCLOHEXANE IMPURITY FROM CRUDE HEXAMETHYLENEDIAMINE

Robert Clifford Blackstone, Orange, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 7, 1972, Ser. No. 278,461

Int. Cl. C07c *87/14*

U.S. Cl. 260—583 N 6 Claims

A process for removing 1,2-diaminocyclohexane impurity from crude hexamethylenediamine by contacting the crude hexamethylenediamine with a carbohydrate having from 3 to 12 carbon atoms and an acid catalyst to produce a reaction product of low volatility and thereafter distilling the hexamethylenediamine of reduced impurity level from the reaction product.

3,781,363

FUEL AND LUBE COMPOSITIONS

Larry Plonsker, Bloomfield Hills, Warren L. Perilstein, Orchard Lake, and Robert E. Malec, Birmingham, Mich., assignors to Ethyl Corporation, Richmond, Va.

No Drawing. Original application Nov. 16, 1970, Ser. No. 90,003, now Patent No. 3,700,598. Divided and this application Aug. 24, 1972, Ser. No. 283,630

Int. Cl. C07c *87/04*

U.S. Cl. 260—583 P 7 Claims

The dispersant and detergent properties of lubricating oils and liquid hydrocarbon fuels such as gasoline are improved by addition of a small but effective amount of an N-hydrocarbyl-substituted nitrilotris ethylamine. The hydrocarbyl group is preferably a polyolefin group, such as a polybutene group, having a molecular weight of from about 300 to 20,000 more preferably from 500 to 2,000.

3,781,364

SATURATION OF UNSATURATED ALDEHYDES

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Apr. 27, 1970, Ser. No. 32,464

Int. Cl. C07c *45/12*

U.S. Cl. 260—601 R 6 Claims

It is disclosed that ethylenically unsaturated aldehydes can be saturated without hydrogenation of the aldehyde group by contacting the aldehyde with carbon monoxide and water in the presence of a rhodium, iridium or ruthenium complex with a biphyllic ligand catalyst. The reaction is performed under relatively mild conditions at temperatures from 30° to 300° C. and at pressures from 1 to about 1000 atmospheres using an aqueous liquid phase having dispersed or dissolved therein the catalytic quantities of the noble metal-biphyllic ligand complex.

3,781,365

STABILIZATION OF AQUEOUS FORMALDEHYDE SOLUTIONS

Roy H. Prinz, Robstown, and Bob C. Kerr, Kingsville, Tex., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Application Dec. 13, 1967, Ser. No. 690,059, which is a continuation-in-part of application Ser. No. 360,137, Apr. 15, 1964, which is a continuation-in-part of application Ser. No. 77,525, Dec. 22, 1960, now abandoned, which in turn is a continuation-in-part of applications Ser. No. 811,250, May 18, 1959, now Patent No. 3,137,736, Ser. No. 744,059, June 24, 1958, and Ser. No. 858,868, Dec. 11, 1959, both now abandoned. Divided and this application Jan. 5, 1970, Ser. No. 5,407

Int. Cl. C07c *47/04*

U.S. Cl. 260—606 3 Claims

One aspect of this invention relates to the stabilization of aqueous solutions of formaldehyde with a small amount of a sorbitan ester of a higher fatty acid.

Another aspect of the invention includes the heat treatment of an aqueous formaldehyde solution containing a small amount of any of certain dissolved organic colloids as a stabilizer, to further increase the stabilization of the solution.

3,781,366

PREPARATION OF α-DITHIOLS

Alain Pfister and Emmanuel Arretz, Pau, and Alain Donche, Lescar, France, assignors to Societe Nationale des Petroles d'Aquitaine tour Aquitaine, Courbevoie, France

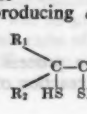
No Drawing. Filed Aug. 27, 1971, Ser. No. 175,754

Claims priority, application France, Aug. 31, 1970, 7031660

Int. Cl. C07c *149/06*

U.S. Cl. 260—609 R 10 Claims

A process for producing α-dithiols with the general formula:



in which R_1, R_2, R_3 and R_4, identical or different, can each be either hydrogen or alkyl radicals such as methyl, ethyl, propyl, possibly substituted by halogen, thiol or hydroxyl groups is disclosed.

This process consists in causing a reaction to occur between an organic ester of a 2-mercaptoalkyl and an alkaline sulphydrate in an aqueous solution in the absence of an organic solvent at temperatures ranging between 50° C. and 160° C., and recovering by decantation the dithiol constituting the organic layer.

The α-dithiols are used in polymerization reactions. They are adducts on double bonds, and are used in the fields of insecticides, pesticides, and fungicides.

3,781,367

PREPARATION OF 4-MERCAPTOPHENOLS

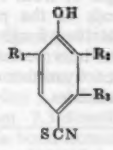
Robert J. Laufer, Colts Neck, N.J., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,193

Int. Cl. C07c *149/36*

U.S. Cl. 260—609 D 9 Claims

Certain thiocyanophenols are converted by caustic hydrolysis under certain conditions to mercaptophenols. The thiocyanophenols which are so converted are those having the following general formula:



where R_1 is hydrogen or a C_1–C_4 alkyl radical; R_2 is hydrogen or a C_1–C_2 alkyl radical; and R_3 is hydrogen or a methyl radical, provided that R_2 is hydrogen when R_1 is a butyl radical.

3,781,368

PRODUCTION OF ALLYLIC ETHERS

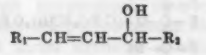
Robert Schwenn Neale, Ossining, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 12, 1971, Ser. No. 105,944

Int. Cl. C07c *41/10*

U.S. Cl. 260—611 R 17 Claims

A liquid phase process for the production of allylic ethers comprising admixing an allylic alcohol having the following structural formula:



wherein R_1 and R_2 are alkyl radicals, straight or branched chain, having 1 to 7 carbon atoms, cycloalkyl radicals having 4 to 10 carbon atoms, aryl radicals having 1 to 2 benzene rings, or alkylene portions of an alicyclic ring, each portion having 1 to 3 carbon atoms, and from zero to six mols per mol of the allylic alcohol of an alcohol having the following structural formula:

$$R_3(OR_4)_nOH$$

wherein R_3 is an alkyl or alkenyl radical, straight or branched chain or cyclic, having 1 to 20 carbon atoms; R_4 is an alkylene radical, straight or branched chain, having 2 to 10 carbon atoms; and n is zero or, provided R_3 is an alkyl radical, an integer from 1 to 100, in the presence of an effective amount of a catalyst consisting essentially of a molybdenum-oxygen complex wherein the molybdenum is in the oxidation states of +4, +5, or +6, or mixtures thereof, and at least 10 mol percent of the molybdenum is in the +5 oxidation state and at a temperature sufficiently high for a reaction to take place.

3,781,369

SUBSTITUTED HALOALKOXY PHENOLS

Eric R. Larsen, Midland, Bernard R. Andrejewski, Linwood, and Fred Y. Edamura, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,683
Int. Cl. C07c 43/22
U.S. Cl. 260—613 D 9 Claims

Novel substituted haloalkoxy- or haloalkylthio-phenol or thiophenol compounds corresponding to the formula:

wherein

Each X independently represents hydrogen, bromo, chloro or fluoro, with the proviso that at least one X is always bromo, chloro or fluoro;

Y and Y' each independently represent oxygen or sulfur;

Each M independently represents bromo, chloro, fluoro, iodo, nitro or loweralkyl containing from 1 to about 4 carbon atoms, both inclusive, and

a represents an integer of from 1 to 3, both inclusive.

The novel compounds of the present invention are suitable for use as herbicides, fungicides and insecticides, and are further useful as intermediates in the preparation of substituted ethyl phenoxyacetate compounds, which in turn have utility as herbicides.

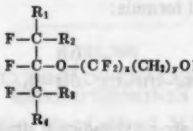
3,781,370

NOVEL FLUORINATED ALCOHOLS

Louis G. Anello, Orchard Park, and Richard F. Sweeney, Elma, N.Y., and Morton H. Litt, Cleveland, Ohio., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 721,089, Apr. 12, 1968, which is a continuation-in-part of application Ser. No. 633,359, Apr. 25, 1967, now Patent No. 3,514,487. This application Dec. 18, 1970, Ser. No. 99,722
Int. Cl. C07c 43/00
U.S. Cl. 260—615 F 5 Claims

Novel alcohols of the formula:



wherein

(a) R_1–R_4 are each independently selected from the group consisting of F, Cl, and perhaloalkyl groups having from 1–9 carbon atoms in which the halo atoms are selected from fluoro and chloro, or when taken together the R_1 and R_4 groups may be perhaloalkylene groups forming a cycloaliphatic structure having from 4–6 carbon atoms in which the halo atoms are selected from fluoro and chloro, with the proviso that no more than three of the R_1–R_4 groups are perhaloalkyl groups; and

(b) *x* may be an odd or even integer from 3–20 and *y* may be an odd or even integer from 2–20;

are useful as surfactants and as solvents for solution polymerization, and as intermediates for the production of a variety of acids, acid derivatives and polyacrylates which are valuable as surfactants and oil, stain and water repellent compositions.

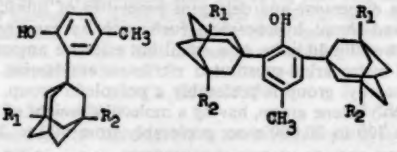
3,781,371

2-ADAMANTYL- AND 2,6-DIADAMANTYL-p-CRESOLS

Alfred F. Talbot, Wallingford, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Jan. 24, 1973, Ser. No. 326,343
Int. Cl. C07c 39/12
U.S. Cl. 260—619 D 11 Claims

New adamantane substituted cresols having the structures:



wherein R_1 and R_2 are hydrogen or hydrocarbyl radicals containing from 1 to 10 carbon atoms selected from the group of alkyl, cycloalkyl and aryl. The novel compositions of matter are useful as polymer stabilizers which inhibit the decomposition of hydrocarbon polymers like polyethylene, polypropylene, polybutenes, styrenebutadiene copolymers, poly(4 methyl pentene) and the like.

3,781,372

PROCESS FOR PURIFICATION OF HEXACHLOROPHENE

Leon M. Polinski, North Plainfield, N.J., and Milton M. Sonn, Bronx, N.Y., assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed Apr. 13, 1971, Ser. No. 133,711
Int. Cl. C07c 37/22
U.S. Cl. 260—619 A 9 Claims

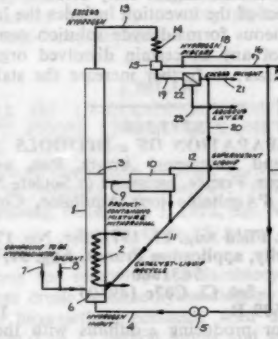
There is provided a novel method of purifying hexachlorophene by removing therefrom unreacted trichlorophenol. The method comprises treating solutions of hexachlorophene contaminated with trichlorophenol which is a starting material in the process of manufacture of the principal product, with molecular sieves of predetermined pore size which selectively remove the trichlorophenol.

3,781,373

CONTINUOUS PROCESS FOR CONDUCTING LIQUID PHASE CHEMICAL REACTIONS

Georges Gobron and Robert Pipon, Melle, France, assignors to Melle-Bezons, Melle, France

Original application Mar. 9, 1967, Ser. No. 621,881, now Patent No. 3,546,296. Divided and this application Dec. 4, 1970, Ser. No. 95,074
Claims priority, application France, Mar. 10, 1966, 52,904
Int. Cl. C07c 31/18
U.S. Cl. 260—635 C 4 Claims



This disclosure describes a process and apparatus for continuously carrying out a reaction of the type in which

a gaseous phase is dispersed throughout a liquid phase to maintain a particulate solid suspended in the liquid phase. The reaction is carried out in an elongated reaction vessel while continuously introducing liquid phase, and continuously withdrawing liquid phase containing solid phase and dissolved products. A portion of the liquid phase containing the dissolved products is continuously collected and a portion, together with the solid phase is returned to the reaction mixture. The reaction apparatus is designed so that under the conditions of the reaction there is a continuous flow of the liquid phase throughout the apparatus without pumping.

3,781,374

METHOD FOR THE ISOLATION OF TETRANITROMETHANE FROM A SOLUTION OF NITRIC ACID WITH COMPARATIVELY LOW CONTENTS OF TETRANITROMETHANE

Kåre Ragnvald Fossan, Nora, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

No Drawing. Filed Dec. 11, 1972, Ser. No. 314,071
Claims priority, application Sweden, Aug. 3, 1972, 10,098/72
Int. Cl. C07c *79/14*
U.S. Cl. 260—644 4 Claims

A method for the isolation of tetranitromethane from a solution of nitric acid with comparatively low contents of tetranitromethane is disclosed according to which method a mixture comprising tetranitromethane and nitric acid is subjected to distillation to cause an azeotropic mixture of 30% of tetranitromethane and 70% of HNO_3 to evaporate, whereafter the distillate consisting of the azeotropic mixture is added with water in order to break the azeotrope.

3,781,375

PROCESS FOR PREPARATION OF 1,5-DIMETHYL NAPHTHALENE AND/OR 1,6-DIMETHYL NAPHTHALENE AND CATALYST COMPOSITION TO BE USED FOR SAID PROCESS

Takeo Shima, Takanori Urasaki, Isau Oka, and Wataru Funakoshi, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Dec. 21, 1971, Ser. No. 210,615
Claims priority, application Japan, Dec. 26, 1970, 45/129,786; Sept. 29, 1971, 46/76,193
Int. Cl. C07c *15/24*
U.S. Cl. 260—668 D 16 Claims

In the process for preparing 1,5-dimethyl naphthalene and/or 1,6-dimethyl naphthalene by catalytically dehydrogenating 1,5-dimethyl tetralin and/or 1,6-dimethyl tetralin at 300–450° C. in the gas phase in the presence of a dehydrogenation catalyst, an improvement wherein the gas phase catalytic dehydrogenation is carried out in the presence of a catalytic amount of a chromia-alumina catalyst.

3,781,376

DEHYDROGENATION PROCESS AND CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Filed June 30, 1971, Ser. No. 158,531
Int. Cl. C07c *3/28, 11/12*
U.S. Cl. 260—683.3 10 Claims

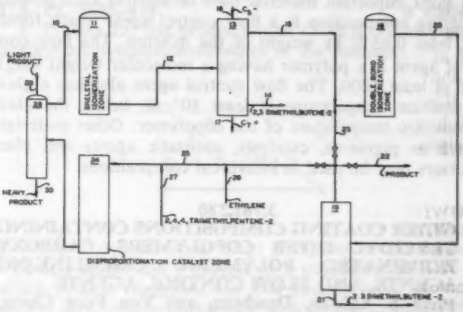
Magnesium chromites promoted with aluminum have been found to be superior to chromia-alumina type dehydrogenation catalysts, for example, in the dehydrogenation of n-butane. The aluminum is either added to the preformed magnesium chromite or is incorporated into the spinel structure of the chromite itself or added in both ways. The aluminum will be present in the catalyst from all sources in an atomic ratio of Al:Cr of 0.0004 to 1.2:1. The atomic ratio will more usually be 0.04 to 0.8:1, Al:Cr.

3,781,377

ISOMERIZATION OF NEOHEXENE

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation-in-part of abandoned application Ser. No. 859,815, Sept. 22, 1969. This application Dec. 6, 1971, Ser. No. 205,377
Int. Cl. C07c *5/24*
U.S. Cl. 260—683.2 11 Claims



Neohexene is skeletally isomerized to 2,3-dimethylbutene-2 with excellent selectivity and conversion utilizing an alumina catalyst containing 0.1 to 0.2 weight percent sodium oxide and having a surface area of 150 to 180 square meters per gram. 2,3-dimethylbutene-1 produced in the reaction is double bond-isomerized to provide additional 2,3-dimethylbutene-2. Where the neohexene is produced by disproportionation of 2,4,4-trimethylpentene-2 and ethylene, a dimethylbutene-1 fraction containing methylpentenes from the second isomerization step can be advantageously fed to the disproportionation catalyst zone, thereby eliminating the problem of separating the methylpentenes.

3,781,378

HIGH TEMPERATURE MEMBRANE MATERIALS

Simon W. Kantor, Schenectady, and Peter C. Juliano, Scotia, N.Y., assignors to General Electric Company

No Drawing. Filed Nov. 24, 1971, Ser. No. 201,973
Int. Cl. C08g *47/10*
U.S. Cl. 260—824 R 5 Claims

Block copolymers of polydiorganosiloxane and polycarbonate are provided having improved heat distortion and useful as high temperature membrane material. The polydiorganosiloxane-polycarbonate block copolymer membranes can be steam sterilized at elevated temperatures without altering membrane structure. A method for making such block copolymers also is provided utilizing certain dihydric phenols derived from cyclic ketones such as fluorenyl bisphenols, to make the polycarbonate blocks.

3,781,379

POWDERED COATING COMPOSITIONS CONTAINING GLYCIDYL METHACRYLATE COPOLYMERS WITH ANHYDRIDE CROSSLINKING AGENTS AND FLOW CONTROL AGENT

Ares N. Theodore, Farmington, and Santokh S. Labana, Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,224
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 9 Claims

Powder coating compositions are disclosed. In general, individual powder coating compositions of this invention are a mixture of several materials. One of the important materials is a copolymer of glycidyl methacrylate and an ethylenically unsaturated compound

formed to obtain a copolymer with a glass transition temperature in the range of 40° C. to 90° C. and a molecular weight ($\overline{M}_n$) in the range of 2500 to 8500. The glacidyl methacrylate is present in the copolymer from at least about 5% by weight to no more than about 20% by weight. Another important material of each coating composition is a crosslinking agent formed in an anhydride of a dicarboxylic acid present in the amount of 0.4 to 1.0 anhydride groups for each epoxy group in the copolymer. A third important material used in forming each powder coating composition is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ($\overline{M}_n$) of at least 1000. The flow control agent also has a glass transition temperature at least 50° C. below the glass transition temperature of the copolymer. Other materials such as pigments, catalysts, antistatic agents and plasticizers may be used in individual compositions.

3,781,380

POWDER COATING COMPOSITIONS CONTAINING GLYCIDYL ESTER COPOLYMERS, CARBOXY TERMINATED POLYMERIC CROSSLINKING AGENTS, AND FLOW CONTROL AGENTS

Santokh S. Labana, Dearborn, and Yun Feng Chang, Plymouth, Mich., assignors to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Aug. 16, 1971, Ser. No. 172,229
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 **22 Claims**

Powder coating compositions are disclosed. In general, individual powder coating compositions are a mixture of the following materials. A copolymer of glycidyl methacrylate and an ethylenically unsaturated compound is formed in such proportions as to obtain a copolymer with a glass transition temperature in the range of 40° C. to 90° C. and a molecular weight ($\overline{M}_n$) in the range of 2500 to 8500. The glycidyl methacrylate is present in the copolymer from at least about 8% by weight to no more than about 30% by weight. Another material of the coating composition is a cross linking agent formed of a carboxy terminated polymer present in the amount of 0.8 to 1.1 carboxy groups for each epoxy group in the copolymer. A third material used in forming the powder coating mixture is a flow control agent which forms at least 0.05% by weight of the mixture. The flow control agent is a polymer having a molecular weight ($\overline{M}_n$) of at least 1000. The flow control agent also has, at the baking temperature of the powder coating composition, a lower surface tension than the surface tension of the copolymer.

3,781,381

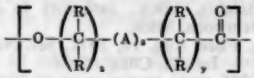
NYLON POLYMERS BLENDED WITH CYCLIC ESTER POLYMERS

Joseph Victor Koleske and Clyde Jesse Whitworth, Jr., Charleston, W. Va., and Robert Dean Lundberg, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 812,314, Apr. 1, 1969. This application May 6, 1971, Ser. No. 140,951
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PE **12 Claims**

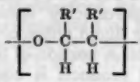
Uniform, thermoplastic, normally solid blends containing cyclic ester polymers containing recurring units of the formula

(I)



wherein each R, individually, is selected from the class consisting of hydrogen, alkyl, halo, and alkoxy; A is the oxy group; x is an integer from 1 to 4; y is an integer from 1 to 4; z is an integer of zero or one; with the provisos that (a) the sum of $x+y+z$ is at least 4 and not greater than 7, and (b) the total number of R variables which are substituents other than hydrogen does not exceed 3, with or without recurring units of the formula

(II)



wherein each R′ is selected from the class consisting of, individually, hydrogen, alkyl, cycloalkyl, aryl, and chloroalkyl, and together with the ethylene moiety of the oxyethylene chain of Unit II, a saturated cycloaliphatic hydrocarbon ring having from 4 to 8 carbon atoms, and thermoplastic, normally solid polymer which can be a condensation polymer, and/or an addition polymer of olefinically unsaturated monomers having no more than one hydrogen bonded to each carbon of each olefinically unsaturated group thereof, including such polymers as cellulose derivatives, nylons, polyester polymers, polyoxyalkylenes, polycarbonates, poly(fluorocarbons), coumarone-indene resins, maleic acid or anhydride addition polymers and copolymers, stilbene addition polymers and copolymers, chlorinated polyethers, aromatic poly(hydroxy ether) polymers, polysulfones, polypeptides, etc.

These novel blends are useful in the production of fibers, films, coatings, adhesives, wire and cable coatings, molding materials, extrusion materials, or shaped articles, having one or more unique properties, such as, dyeability, improved stress crack resistance, improved optical properties, e.g., improved hiding power, low haze, high gloss and/or high light transmission, improved plasticization, improved toughness, improved melt processability, improved impact resistance, and/or improved ability to disperse additives, such as, fillers, coloring agents, antioxidants, extenders, etc.

3,781,382

THERMOPLASTIC RESIN MIXTURE AND PROCESS FOR PRODUCING THE SAME

Shinichi Izawa, Tokyo, and Kunio Toyama, Kazuhiko Harada, and Yoshiaki Sugawara, Kanagawa, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,171
Claims priority, application Japan, Sept. 8, 1970, 45/78,220
Int. Cl. C08f *27/00*; C08g *43/02*
U.S. Cl. 260—874 **6 Claims**

Polyphenylene ether compositions which are useful for parts of electric devices, and having particle sizes of 5 micron or larger, together with aromatic monovinyl compound polymers. They are prepared by the oxidative polymerization of 2,6-dimethylphenol or the like by air, in the presence of a catalyst therefor, aromatic monovinyl compound and a medium which dissolves the above-mentioned compounds but does not dissolve polyphenylene ether having a specific viscosity of 0.25 or more, wherein the concentration of the above-mentioned phenol is 15 to 35% by weight, and the polymerization product is dispersed in water and then the dispersion is polymerized to polymerize the aromatic vinyl compound.

3,781,383

IMPACT VINYL AROMATIC POLYMERS AND THEIR PREPARATION

Arnold B. Finestone and Richard C. Westphal, Leominster, and Charles Brac, Jr., Sterling, Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

No Drawing. Continuation of abandoned application Ser. No. 850,640, Aug. 15, 1969. This application Jan. 24, 1972, Ser. No. 220,526
Int. Cl. C08f *19/08*
U.S. Cl. 260—876 **19 Claims**

Impact vinyl aromatic polymers having improved surface appearance, good impact and tensile strengths and good flow characteristics are prepared by mass polymeriz-

ing, until about 2 to 15% of the monomer has been converted to polymer, at least one monovinyl aromatic compound having dissolved therein at least one 1,3-butadiene rubbery polymer, adding a mercaptan molecular weight modifying agent to the polymerization mixture and completing the polymerization.

3,781,384

POLYMERIZATION OF ABS RESINS IN THE PRESENCE OF UNSATURATED ALPHA-METHYLSTYRENE DIMERS

Arnold B. Finestone, Leominster, Jack Milgrom, Concord, and Stephen V. Slovenkai, Leominster, Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

No Drawing. Continuation of abandoned application Ser. No. 850,639, Aug. 15, 1969. This application Jan. 24, 1972, Ser. No. 220,524

Int. Cl. C08f *15/40, 19/02, 19/08*

U.S. Cl. 260—879 16 Claims

Solvent resistant polymers having improved surface appearance, and good impact and tensile strengths are prepared by mass polymerizing, until about 2 to 15% of the monomeric components are converted to polymer, a monomeric mixture of at least one monovinyl aromatic compound and at least one unsaturated organonitrile compound, the monomeric mixture having dissolved therein at least one rubbery polymer, adding unsaturated alpha-methylstyrene dimers to the polymerization mixture and completing the polymerization.

3,781,385

POLYMERIC PHENOLIC PHOSPHOROUS ACID ESTER AMIDES

Elmar H. Jancis, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Apr. 5, 1971, Ser. No. 131,077

Int. Cl. C07f *9/08, 9/12*

U.S. Cl. 260—930 12 Claims

Polymeric phenolic phosphorous ester amides, made by reacting an alkylated hydroquinone (e.g., 2,5-di-tert.-butylhydroquinone) with phosphorus trichloride and subsequently reacting the product with an amine (e.g., diisopropylamine), are useful as stabilizers for polymers (e.g., polypropylene, polyvinyl chloride EPDM).

3,781,386

O-(METHYLCYCLOHEXYL)-S-METHYL-S-PHENYL-PHOSPHORODITHIOLATES

Shigeo Kishino, Yasuo Yamada, Yoshio Kurahashi, and Toyohiko Kume, Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

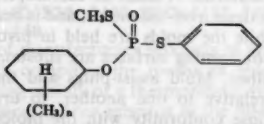
No Drawing. Filed July 7, 1972, Ser. No. 269,699

Claims priority, application Japan, July 16, 1971, 46/52,393

Int. Cl. A01n *9/36;* C07f *9/16*

U.S. Cl. 260—958 7 Claims

O - (methylcyclohexyl)-S-methyl-S-phenyl-phosphorodithiolates of the general formula



(I)

in which *n* is 1 or 2, which possess fungicidal and bactericidal properties.

3,781,387

PREPARATION OF O-ALKYL S-DIALKYL-PHOSPHONOTHIOLATES

Arthur Henry Ford-Moore, Salisbury, and Alan Bebbington, Wistaston, Crewe, England, assignors to the Minister of Supply in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland

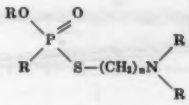
No Drawing. Filed Nov. 2, 1956, Ser. No. 620,155

Claims priority, application Great Britain, Nov. 3, 1955, 31,438/55

Int. Cl. C07f *9/40*

U.S. Cl. 260—979 4 Claims

1. Process for the production of O-alkyl S-dialkylaminoalkyl alkylphosphonothiolates of the formula:



in which R denotes lower alkyl groups of not more than 3 carbon atoms and *n* represents a number from 1 to 3, which process comprises the half hydrolysis of an O,O-dialkyl alkylphosphonothionate with ethanolic sodium hydroxide by heating the mixture at reflux temperatures to form a monoalkyl hydrogen alkylphosphonothionate, separating the said monoalkyl hydrogen compound and reacting the same with sodium methoxide in methanol to form the corresponding sodium salt, then removing the methanol by azeotropic distillation with benzene and reacting the said sodium salt with a dialkylaminoalkyl chloride by heating the mixture at reflux temperatures and then allowing the mixture to cool to room temperature, ading a low-boiling hydrocarbon to precipitate the sodium chloride by-product, filtering the same and isolating the product from the filtrate by distillation.

3,781,388

PHOSPHATES

Herbert Jenkner and Otto Konigstein, Cologne, Germany, assignors to Chemische Fabrik Kalk GmbH

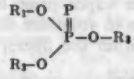
No Drawing. Filed Sept. 21, 1971, Ser. No. 182,543

Claims priority, application Germany, Sept. 25, 1970, P 20 47 195.8

Int. Cl. C07f *9/08*

U.S. Cl. 260—953 9 Claims

A flame-proofing agent, to polymers, of the formula:



R_1 being an halogenated alkyl group; R_2 is an alkyl group and R_3 is a hydroxy alkyl group.

3,781,389

PROCESS FOR THE PRODUCTION OF SUBSTITUTED THIONOPHOSPHORYL CHLORIDES

Peter Beutel, Mannheim, and Karl-Heinz Koenig, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed June 21, 1971, Ser. No. 155,229

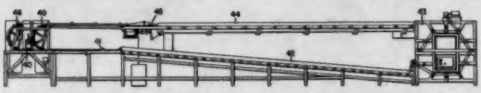
Claims priority, application Germany, July 21, 1970, P 20 36 048.9

Int. Cl. C07f *9/20*

U.S. Cl. 260—986 11 Claims

A process for the production of substituted thionophosphoryl chlorides by reaction of thionophosphoric acids with phosgene.

3,781,390
CONTINUOUS MOLDING METHOD
Howard F. Wells, Rochester, N.Y., assignor to The Schlegel Manufacturing Co., Inc., Rochester, N.Y.
Application Jan. 22, 1969, Ser. No. 814,868, now Patent No. 3,700,368, which is a continuation-in-part of abandoned application Ser. No. 460,404, June 1, 1965. Divided and this application July 19, 1972, Ser. No. 273,172
Int. Cl. B29c 5/10
U.S. Cl. 264—47 8 Claims



A continuous foamed strip molding method uses two continuous lengths of mold halves that snap-fit together to hold the foamed strip and are flexible enough to be driven in a curved path with one mold half inside the other for high speed and adequate cure time in relatively small space.

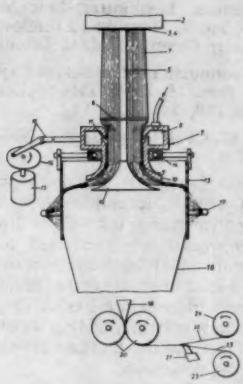
3,781,391
METHOD FOR PRODUCING ACRYLIC HOLLOW FIBERS
Keitaro Shimoda, Keijiro Kuratani, and Akira Sugiura, Saidaiji, Japan, assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation-in-part of abandoned application Ser. No. 792,819, Jan. 21, 1969. This application July 25, 1972, Ser. No. 274,935
Claims priority, application Japan, Jan. 24, 1968, 43/4,477
Int. Cl. D01f 7/00
U.S. Cl. 264—53 10 Claims

The formation of acrylic fibers with void spaces therein by wet spinning employing aqueous thiocyanate salts as both polymer solvent and fiber coagulant by dispersing selected volatile liquids in the spin dope at a concentration of 25–100 weight percent based on the weight of polymer therein, (a) spinning the spin dope into the coagulant maintained at less than about 20° C., (b) washing the coagulated wet gel fibers at a temperature below about 40° C. and (c) thereafter passing the fibers through boiling water or water vapor prior to or in conjunction with hot-drawing so as to volatilize the volatile liquid and obtain void spaces within the fibers.

3,781,392
PRODUCTION OF SINTERED POROUS METAL FLUORIDE PELLETS
Lowell W. Anderson and Michael J. Stephenson, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Oct. 7, 1971, Ser. No. 187,573
Int. Cl. B01j 1/22; C01f 7/50; C04b 35/64
U.S. Cl. 264—65 7 Claims

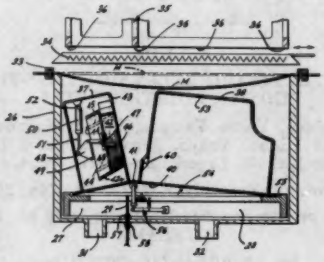
Porous pellets characterized by a moderately reactive crust and a softer core of higher reactivity are produced by forming agglomerates containing a metal fluoride powder and a selected amount of water. The metal fluoride is selected to be sinterable and essentially non-reactive with gaseous fluorinating agents. The agglomerates are contacted with a gaseous fluorinating agent under controlled conditions whereby the heat generated by localized reaction of the agent and water is limited to values effecting bonding by localized sintering.

3,781,393
PROCESS FOR THE CONTINUOUS PRODUCTION OF A RANDOM-FILAMENT FLEECE
Karl-Heinz Feltgen, Dormagen, and Günther Espanion, Cologne-Mauenheim, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Original application Sept. 7, 1968, Ser. No. 848,138, now Patent No. 3,621,531. Divided and this application July 15, 1971, Ser. No. 165,779
Claims priority, application Germany, Sept. 7, 1968, P 17 85 302.0
Int. Cl. B29c 17/04
U.S. Cl. 264—89 6 Claims



Process for forming a random-filament fleece by supplying filaments to a trumpet-shaped aerodynamic take-off which throws the filaments against a collecting means where the filaments adhere to form a tubular fleece.

3,781,394
METHOD FOR FORMING ARTICLES FROM PLASTIC SHEET MATERIAL
Norman F. Houghton, Connersville, Ind., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed Mar. 20, 1972, Ser. No. 235,968
The portion of the term of the patent subsequent to Jan. 9, 1990, has been disclaimed
Int. Cl. B29c 17/04
U.S. Cl. 264—89 2 Claims



A vacuum-forming operation in which a pair of adjacent compartment liners are formed from a single sheet of thermoplastic material. A sheet of thermoplastic material is disposed to extend over the molds, and is heated, causing it to soften while the molds are held in pivoted position in which the confronting surfaces are substantially spaced from one another. Mold assist-plugs and the molds are then moved, relative to one another, to urge the sheet into general close conformity with the molds. While the sheet of material is still soft, the assist-plugs further are caused to engage the mold frame structure, through the

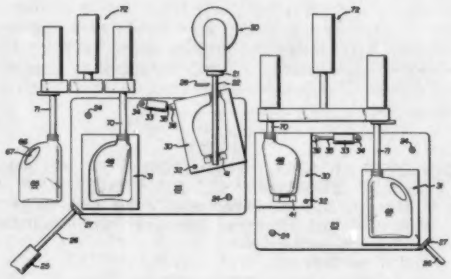
intermediacy of the sheet, pivoting the frame structure and causing adjacent wall portions of the molds to move toward one another and assume their closely spaced position. Air entrapped between the heated sheet and the walls of the mold not provided with the auxiliary section is then evacuated through a number of small ports or vents in the walls, thereby forming one of the desired liners, whereupon the auxiliary section of the other mold is projected and air entrapped between the heated sheet and the mold is evacuated, forming the other of the desired liners with an undercut region. The liners are then cooled, the extended auxiliary mold section is retracted from the undercut region, and the liners are stripped as a unit from the molds.

3,781,395

METHOD FOR BLOW MOLDING PLASTIC ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Jan. 28, 1971, Ser. No. 110,685
Int. Cl. B29c *17/07*
U.S. Cl. 264—89 **8 Claims**



A method of blow molding plastic articles in two blowing stages. A freely extruded pendant tubular parison is first blown into a pre-form, then the pre-form, while at the temperature most conductive to orientation, is blown to its final configuration. By performing certain operations on the pre-form prior to the final blowing step, improved products can be made. For example, by pinching shut a portion of the pre-form, handled containers can be made on a free extrusion blow molding machine. By stretching the pre-form prior to final blowing, containers of increased top-load or stacking capabilities can be made.

3,781,396

METHOD OF MANUFACTURING SYNTHETIC RESIN-CEMENT PRODUCTS

Minoru Okuda, Satoru Aikawa, Hiromu Kaidzu, and Eiichi Tajima, Tokyo, Japan, assignors to Tajima Oyo Kako Co., Ltd., Tokyo, Japan

No Drawing. Filed Feb. 17, 1972, Ser. No. 227,260
Claims priority, application Japan, Feb. 26, 1971, 46/9,385
Int. Cl. B28c *5/00;* B28b *3/12, 3/20*
U.S. Cl. 264—140 **5 Claims**

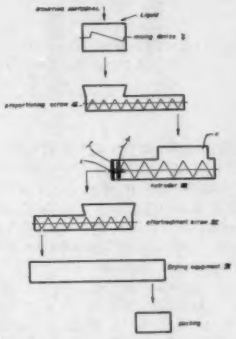
A method of manufacturing products of synthetic resin-cement, which comprises the means of shaping a compound consisting mainly of a thermoplastic synthetic resin, cement, and sand and/or asbestos as the filler in addition thereto by kneading while applying heat, and the means of hardening the resulting products by heating while applying pressure in the presence of water.

3,781,397

CONTINUOUS PRODUCTION OF PREFORMED MOLDING MATERIALS

Richard Gauer, Wiesbaden, and Uwe Skurnia and Manfred Richter, Wiesbaden-Biebrich, Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany

Continuation of abandoned application Ser. No. 777,299, Nov. 20, 1968. This application Dec. 10, 1970, Ser. No. 96,983
Claims priority, application Germany, Nov. 22, 1967, P 16 29 732.8
Int. Cl. B01j *2/20*
U.S. Cl. 264—142 **3 Claims**



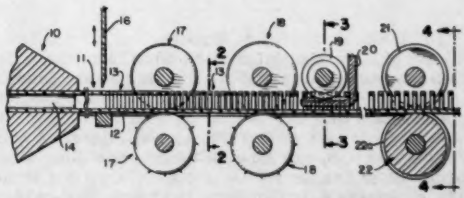
A process for the continuous production of dust-free preformed molding materials, substantially uniform in geometrical and physical properties and chemical constitution, in a single step and without an intermediate drying, wherein a hardenable synthetic resin is mixed with reinforcing materials and additives in a mixing device, then continuously fed by a metering screw into an extruder provided with a perforated disc and a cutter head, in which it is compressed, preformed and precut, wherein the extrudate is passed to an aftertreatment screw wherein it is divided in granules having a substantially uniform length, smooth surface and rounded ends and then dried.

3,781,398

HOOK FASTENER ELEMENT AND METHOD OF MANUFACTURE

George H. Erb, Rutland, Vt., assignor to American Velcro, Inc.

Filed May 11, 1972, Ser. No. 252,239
Int. Cl. B28b *11/16;* B29d *5/00*
U.S. Cl. 264—146 **10 Claims**

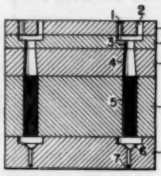


A hook fastener element formed from extruded stock having a base sheet and adjacent longitudinally arranged parallel members of generally heart-shaped cross section integrally connected to said base and apparatus and method for forming hooks from said extruded stock.

3,781,399
METHOD FOR PRODUCING A COMPOSITE FIBER

Hidehiko Kobayashi, Kiichiro Sasaguri, and Masaaki Shiga, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 16, 1969, Ser. No. 858,295
Claims priority, application Japan, Oct. 2, 1968, 43/71,742; Nov. 1, 1968, 43/79,271, 43/79,272
Int. Cl. B29f 3/10
U.S. Cl. 264—171 2 Claims

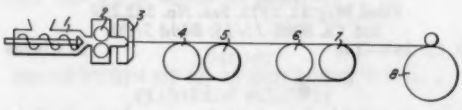


A method for producing a composite polymeric fiber which involves introducing a first polymer having fiber forming properties into a first inlet zone, introducing a second polymer having fiber forming properties into a second inlet zone, said first and second polymers having inherently poor adherent properties relative to each other, causing *all* of said first and second polymers exiting from said first and second inlet zones to flow into a mixing zone that does not communicate with any other inlet zones, said mixing zone being at least partially filled with a packing material having a diameter of about 0.2 mm. to 2 mm. and which forms a bed at least 5 mm. thick and causing *all* of the polymers flowing through said packed mixing zone to thereafter be extruded through a *single* spinning hole as a *single* composite fiber, the single composite fiber exiting from said single spinning hole having a jagged boundary interface for the component polymers, said jagged boundary interface being minutely and irregularly complicated when viewed from both the transverse and longitudinal axes of the filament.

3,781,400
PROCESS FOR PRODUCING ELASTIC FILAMENTS AND BRISTLES

Paul Couchoud and Vincent Rochina, Lyons, France, assignors to Societe Rhodiaceta, Paris, France

Original application Dec. 24, 1969, Ser. No. 887,987, now abandoned. Divided and this application Sept. 28, 1971, Ser. No. 184,631
Int. Cl. D01d 5/12
U.S. Cl. 264—210 F 11 Claims

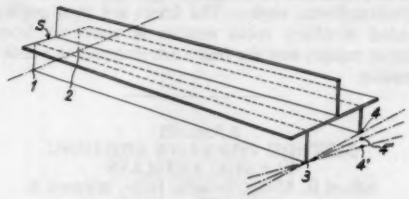


The invention comprises filaments and bristles having a basis of a diorganopolysiloxane which combine a kilometric breaking strength above 1.25 with an elongation at break of at least 300%. They are made from diorganopolysiloxanes in which at least 60% of the organic substituent groups are methyl and a small proportion (0.3–2%) are vinyl, by extrusion followed by stretching, a heat treatment to "vulcanize" the products, a further stretch and preferably a further heat treatment. The products may also be given a third heat treatment while wound up on a support. The composition which is extruded contains, besides the diorganopolysiloxane, a filler, a crosslinking catalyst, preferably of the free radical type, and optionally a plasticizer, especially an organisilicon compound.

3,781,401
METHOD OF MAKING SKEW ELEMENTS OF PRESTRESSED CONCRETE

Jean Courbon, Tour de Seine, 39 Quai de Grenelle, Paris XV, France

Continuation-in-part of application Ser. No. 882,586, Dec. 5, 1969. This application Jan. 11, 1972, Ser. No. 217,010
Int. Cl. B28b 21/60
U.S. Cl. 264—228 5 Claims

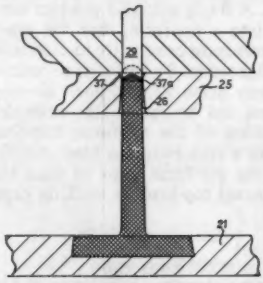


This method of producing a skew structure from a rectilinear structure without causing its ultimate distortion to impose a stress thereto, consists in applying firstly to said structure, during the storage thereof for curing purposes, a provisional distortion in the same direction as said ultimate distortion but of higher value, thus introducing a stress substantially equal, but in a direction substantially opposite, to that introduced by the distortion necessary for restoring the corresponding structure to the desired ultimate distortion, and subsequently imposing said ultimate distortion to said structure after a suitable time period.

3,781,402
PROCESS FOR THE PRODUCTION OF BRUSHES OR A PART THEREOF INCLUDING THE BRISTLES

Peter Hanggi, 23b Birchlerstrasse, 8600 Dubendorf 2, Switzerland, and Hermann Budmiger, 114 Muhlmatt, 4206 Seewen, Switzerland

Filed Nov. 12, 1971, Ser. No. 198,163
Claims priority, application Switzerland, Nov. 12, 1970, 16,769/70
Int. Cl. B29c 17/02
U.S. Cl. 264—243 7 Claims



Brushes or parts thereof including the bristles are produced by injecting plastic material into the cavity of a mold comprising a plurality of segments each having at least one opening therein, the openings forming the cavity. The openings in the segments at opposite ends of the cavity are designed to retain a base section and a head portion respectively of the molded plastic material so that when these two segments are subsequently moved away from each other the connecting plastic material is stretched forming bristle shafts of improved strength with the molecules therein oriented. The head portion is then either severed from the shaft or means is provided for pressing the head portion through the hollow spaces of each of the intermediate segments to remove the brush or part thereof from the mold.

3,781,403

RECOVERY OF PROTACTINIUM FROM MOLTEN FLUORIDE NUCLEAR FUEL COMPOSITIONS

Charles F. Baes, Jr., and Carlos E. Bamberger, Oak Ridge, and Robert G. Ross, Kingston, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 30, 1971, Ser. No. 203,246
Int. Cl. C01g 57/00
U.S. Cl. 423—5 2 Claims

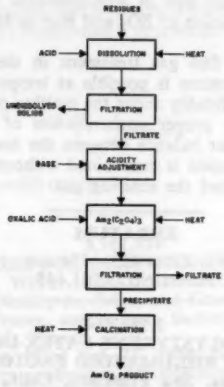
A method is provided for separating protactinium from a molten fluoride salt composition consisting essentially of at least one alkali and alkaline earth metal fluoride and at least one soluble fluoride of uranium or thorium which comprises oxidizing the protactinium in said composition to the +5 oxidation state and contacting said composition with an oxide selected from the group consisting of an alkali metal oxide, an alkaline earth oxide, thorium oxide, and uranium oxide, and thereafter isolating the resultant insoluble protactinium oxide product from said composition.

3,781,404

AMERICIUM RECOVERY FROM REDUCTION RESIDUES

William V. Conner, Nederland, and Stephen G. Proctor, Denver, Colo., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed May 18, 1972, Ser. No. 254,690
Int. Cl. C01g 65/00
U.S. Cl. 423—11 3 Claims



A process for separation and recovery of americium values from container or "bomb" reduction residues comprising dissolving the residues in a suitable acid, adjusting the hydrogen ion concentration to a desired level by adding a base, precipitating the americium as americium oxalate by adding oxalic acid, digesting the solution, separating the precipitate, and thereafter calcining the americium oxalate precipitate to form americium oxide.

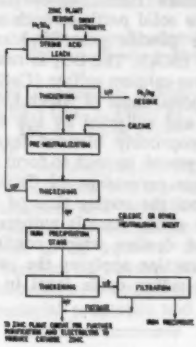
3,781,405

METHOD OF REMOVING DISSOLVED FERRIC IRON FROM IRON-BEARING SOLUTIONS

Robert William Allan, Moonah, Curzon John Haigh, Lindisfarne, and John Hamdorf, Howrah, Tasmania, Australia, assignors to Electrolytic Zinc Company of Australia Limited, Melbourne, Victoria, Australia

Filed Feb. 10, 1971, Ser. No. 114,293
Claims priority, application Australia, May 15, 1970, 1,223/70
Int. Cl. C01g 49/02
U.S. Cl. 423—142 6 Claims

Aqueous acidic solutions containing dissolved ferric iron, together with any one or more of the cations zinc, copper, cobalt or nickel, such solutions having been prepared by the acid leaching of ores, concentrates, calcines, or residues containing iron and zinc, copper, cobalt or nickel, are treated to precipitate the iron in a form possessing greatly enhanced settling and filtering properties. The precipitation of the iron in this easily separable form



is conducted in an agitated reaction vessel to the contents of which are added the ferric iron bearing aqueous acidic solution and a neutralizing agent so that in the reaction vessel the dissolved ferric iron concentration is maintained at less than 1 gram per litre, the pH is maintained in the range 1.7 to 3.5, and the temperature is maintained in the range 50° C. to the boiling point.

3,781,406

PROCESS OF TREATING AUTO EXHAUST WITH SHRINKAGE RESISTANT COPPER ALUMINATE-RARE EARTH CATALYSTS

James F. Roth, Maryland Heights, James W. Gambell, Creve Coeur, and Charles R. Penquite, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 7, 1971, Ser. No. 160,549
Int. Cl. F01n 3/14; B01j 9/04
U.S. Cl. 423—213.2 14 Claims

A shrinkage resistant auto exhaust catalyst comprised of an alumina support and specified amounts of copper, chromium, and specified rare earth compounds, is employed under oxidizing conditions to oxidize carbon monoxide and hydrocarbons in exhaust.

3,781,407

INERT GAS SYSTEM FOR A TANKER

Tatsuo Kamijo and Densuke Nagakura, Yokohama, Japan, assignors to Mitsubishi Kakoki Kaisha, Tokyo, Japan

Filed Oct. 4, 1971, Ser. No. 186,004
Claims priority, application Japan, Feb. 24, 1971, 46/8,617
Int. Cl. C01b 17/00
U.S. Cl. 423—242 8 Claims

An inert gas for flooding compartments or other oil containers of a tanker or other vessel is produced by stripping flue gas of its SO_2 content with an aqueous sodium hydroxide or sodium carbonate solution in a scrubber, and oxidizing the resulting sodium sulfite in the solution with atmospheric oxygen in the same scrubber, whereupon a sodium sulfate solution is obtained which may be discharged overboard without damage to marine life.

3,781,408
AIR POLLUTION CONTROL
Ping-Wha Lin, 506 S. Darling, Angola, Ind. 46703
Continuation-in-part of abandoned application Ser. No. 36,861, May 13, 1970. This application Mar. 16, 1972, Ser. No. 235,343
Int. Cl. B01j *9/04, 9/08;* C01l *17/00*
U.S. Cl. 423—244 10 Claims

Combustion gasses from fuel-burning furnaces are treated to separate solid particles such as fly ash and to oxidize the sulfur dioxide gas (SO_2) contained therein to sulfur trioxide (SO_3). The SO_3 is reacted with excess lime (CaO) to form calcium sulfate ($CaSO_4$). The $CaSO_4$, unspent lime particles, some of which have cracked outer shells of $CaSO_4$, and collected fly ash are packaged dry and used in appropriately blended form together with cement and sand, gravel, or rock to form construction materials, the average percentage of $CaSO_4$ therein being regulated to control the setting time of the cement. The proportion of the excess lime is automatically regulated by process-control devices which continuously monitor and control the reaction applying the parameters of fuel composition, and sulfur oxide level in the combustion gasses.

3,781,409
STABILIZATION OF HYDROGEN PEROXIDE
Theodore F. Munday, Kendall Park, and Kenneth J. Radimer, Little Falls, N.J., assignors to FMC Corporation, New York, N.Y.
No Drawing. Filed Feb. 28, 1972, Ser. No. 230,067
Int. Cl. C01b *15/02*
U.S. Cl. 423—273 9 Claims

Hydrogen peroxide is stabilized against decomposition with a high pH stock solution containing a water-soluble tin compound. Preferably a complexing agent is added either to the high pH stock solution or directly to the hydrogen peroxide solution. The resulting stabilized hydrogen peroxide solution has excellent shelf life and superior resistance to contaminant-induced breakdown of the stabilizing chemicals into a sludge.

3,781,410
PROCESS FOR THE CONCENTRATION AND DEFLUORINATION OF PHOSPHORIC ACID
Georg von Semel, Dortmund, Germany, assignor to Friedrich Uhde GmbH, Dortmund, Germany
Filed July 12, 1971, Ser. No. 161,842
Claims priority, application Germany, Sept. 12, 1970, P 20 45 180.3
Int. Cl. C01b *25/26*
U.S. Cl. 423—321 6 Claims

A process for raising the concentration of phosphoric acid from the 30 to 40 percent to 70 percent and more at low energy requirements while removing any fluorine components. Weak phosphoric acid is contacted and stripped with a low boiling substance that is substantially insoluble in water and phosphoric acid. The vapors are then condensed, the condensates collected and separated, the water expelled is discharged, and the substance is recycled in the process.

3,781,411
PROCESS FOR THE PRODUCTION OF HYDRAZOIC ACID
Charles M. Rowan, Jr., Fort Lauderdale, Fla., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 24, 1970, Ser. No. 92,373
Int. Cl. C01b *21/08*
U.S. Cl. 423—406 23 Claims

The production of hydrazoic acid by acidifying an alkali metal azide or alkaline earth metal azide is described. The by-product salt of the acid concurrently produced is separated from the liquid, and the separated liquid is brought into contact with further quantities of the alkali metal azide or alkaline earth metal azide. Azide and acid values which would otherwise be lost in the by-product stream are retained.

3,781,412
METHOD OF REDUCING POTASSIUM ION CONCENTRATION IN PERCHLORATE SOLUTIONS
Raymond C. Rhees, Henderson, Nev., assignor to Kerr-McGee Chemical Corp.
No Drawing. Filed Jan. 6, 1969, Ser. No. 789,416
Int. Cl. C01b *11/18*
U.S. Cl. 423—476 16 Claims

A method of reducing the potassium ion concentration in a perchlorate solution to less than about 5 mg. potassium per liter by contacting the perchlorate solution with crystals of the perchlorate salt of which the solution is formed. The potassium ions in the solution, upon contacting the crystals, exchange with ions in the crystals and are adsorbed on the crystals to thereby remove potassium from solution. The solution when separated from the crystals, provides a solution from which a perchlorate salt, substantially free of potassium impurities may be produced.

3,781,413
GAS PURIFICATION
Robert E. Opferkuch, Jr., Kettering, and Michael G. Konicek, Dayton, Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.
Filed Oct. 27, 1971, Ser. No. 192,847
Int. Cl. C01b *17/04*
U.S. Cl. 423—574 6 Claims

SO_2 and H_2S are removed from a gas containing either one, or both with one in stoichiometric excess of the other, by the reaction of SO_2 and H_2S in the presence of sulfuric acid.

For example, flue gas treatment in the presence of sulfuric acid solutions is possible at temperatures above 200° F., and preferably above the melting point of sulfur. By selecting the proper concentration of sulfuric acid solution, the water balance between the hot entering gas and the acid solution is maintained without the necessity to significantly cool the entering gas.

ERRATUM

For Class 423—574 see:
Patent No. 3,781,445

3,781,414
ORGOTEIN-POLYSTYRENE LATEX DIAGNOSTIC FOR RHEUMATOID FACTOR
Wolfgang Huber, San Francisco, Calif., assignor to Diagnostic Data, Inc., Mountain View, Calif.
No Drawing. Continuation-in-part of abandoned application Ser. No. 708,492, Feb. 27, 1968. This application Aug. 31, 1971, Ser. No. 176,731
Int. Cl. G01n *31/00, 33/16*
U.S. Cl. 424—12 10 Claims

The sensitivity of polystyrene latex susceptible to coagulation by rheumatoid factor-containing serum is increased by a mixture of such latex and orgotein.

3,781,415
PRODUCT, PROCESS AND COMPOSITION
Sandor Karady, Elizabeth, Seemon H. Pines, Murray Hill, Manuel G. Ly, New Brunswick, and Meyer Sletzinger, North Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Application Mar. 23, 1970, Ser. No. 22,076, which is a continuation-in-part of application Ser. No. 835,307, June 18, 1969, both now abandoned. Divided and this application Sept. 9, 1971, Ser. No. 179,225
Int. Cl. A61k *27/00*
U.S. Cl. 424—308 12 Claims

A novel compound is used to inhibit mammalian decarboxylase, the compound being selected from the group

consisting of L-α-hydrazino-α-substituted - (3,4 - dihydroxyphenyl) propionic acid substantially free of the D isomer, the lower alkyl esters thereof, and the pharmaceutically acceptable salts thereof, wherein the substituent is lower alkyl. Compositions and method of treatment are included.

3,781,416
CARBON DISULFIDE DISINFECTANT FOR COCCIDIA OOCYSTS AND WORM EGGS

Karl-Georg Ellinger, Hamburg, and Henning Schumacher, Friedrichsgabe, Germany, assignors to Sterwin A.G., Zug, Switzerland

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,054
Int. Cl. A01n *11/06;* A61k *27/00*
U.S. Cl. 424—44 15 Claims

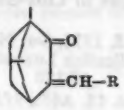
A method is provided for killing coccidia oocysts and worm eggs by contacting them with carbon disulfide which is released by adding an acid to a dithiocarbamate salt.

3,781,417
LIGHT PROTECTION AGENT FOR COSMETIC PURPOSES

Reiner Welters and Horst Russmann, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 190,630, Oct. 19, 1971. This application Dec. 27, 1972, Ser. No. 318,998
Claims priority, application West Germany, Oct. 22, 1970, P 20 51 824.5
Int. Cl. A61l *23/00*
U.S. Cl. 424—59 13 Claims

Topical cosmetic compositions containing as an ultraviolet absorbent comprising a compound of the formula



wherein R is p-tolyl or styryl.

3,781,418
PROCESS FOR COLORING THE SKIN WITH γ-DIALDEHYDES

Jean Pomot, Neuilly-sur-Seine, and Georges Rosenbaum, Asnieres, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

No Drawing. Filed Oct. 21, 1970, Ser. No. 82,836
Claims priority, application Luxembourg, Oct. 22, 1969, 59,682; Mar. 6, 1970, 60,481; Sept. 30, 1970, 61,789
Int. Cl. A61k *7/02*
U.S. Cl. 424—63 2 Claims

A process for coloring the skin comprising applying to the skin in amounts sufficient to develop a coloring of the skin which resembles the tan coloring obtained by prolonged exposure to sunlight, a composition comprising a solution of gamma-dialdehyde.

3,781,419
SCILLILOIDGLYCOSIDE CONTAINING POISON COMPOSITIONS

Tsugiharu Tokunaga, 3–2–35 Yawatacho, Musashinoshi, Tokyo, Japan

No Drawing. Filed June 25, 1970, Ser. No. 49,941
Claims priority, application Japan, July 11, 1969, 44/54,553
Int. Cl. A01n *17/14;* C07c *173/00*
U.S. Cl. 424—84 10 Claims

An effective rodenticidal ingredient, insensitive to atmospheric moisture, is provided by complexing scilliloidglycoside with a phospholipid in the presence of cacao lipid and yoke lipid protein. The effective rodenticidal ingredient is then admixed with various known ingredients such as feeds, pigments, and the like, to form an effective rodenticidal composition.

3,781,420
ANTIBIOTIC TSUSHIMYCIN AND PRODUCTION THEREOF

Haruo Nishimura, Ashiya-shi, and Hideo Otsuka, Toyonaka-shi, Japan, assignors to Shionogi & Co., Ltd., Higashi-ku, Osaka, Japan

Continuation of abandoned application Ser. No. 762,036, Sept. 24, 1968. This application Dec. 19, 1969, Ser. No. 882,784
Claims priority, application Japan, Oct. 4, 1967, 42/63,957; Oct. 7, 1967, 42/64,842
Int. Cl. A61k *21/00*
U.S. Cl. 424—118 6 Claims

A new antibiotic, tsushimycin, having the antibacterial properties with low toxicity, and a process for preparing the same being characterized by cultivating a tsushimycin-producing strain of microorganism belonging to the genus Streptomyces in an aqueous nutrient containing medium under aerobic conditions. Hydrogenated tsushimycin being produced by a catalytic reduction and having similar antibacterial properties and toxicity.

3,781,421
COMPOSITIONS FOR THE NUTRITION OF ANIMALS

Denise Mancy, Charenton, and Leon Ninet and Jean Preud'Homme, Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Continuation-in-part of application Ser. No. 507,773, Nov. 15, 1965, now Patent No. 3,658,987, and a continuation of abandoned application Ser. No. 625,951, Mar. 27, 1967. This application Jan. 10, 1972, Ser. No. 216,830
Claims priority, application France, Nov. 18, 1964, 995,376; Apr. 4, 1966, 56,322
Int. Cl. A61k *21/00*
U.S. Cl. 424—118 6 Claims

The antibiotic 8,036 R.P.—produced by the culture of *Streptomyces canadiensis* (NRRL 3155)—is used as a supplement for animal feedstuffs to accelerate the growth of domestic animals, more especially poultry.

3781,422
THERAPEUTIC SOLUTION OF IRON AND LIPOSOLUBLE VITAMINS

Manfred Bohn, Hofheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 13, 1971, Ser. No. 189,044
Claims priority, application Germany, Oct. 15, 1970, P 20 50 630.3
Int. Cl. A61k *27/00*
U.S. Cl. 424—147 9 Claims

A solution, useful for the joint parenteral administration of iron and certain liposoluble vitamins to young animals, comprising colloidally dissolved iron, an ionogenic surface-active agent, one or more liposoluble vitamins such as A, D, or E, and a non-ionogenic surface-active agent. Methods of making such a solution.

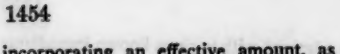
3,781,423
METHOD FOR PREVENTING COLORING OF VITAMIN C

Katsuo Aoka, Nishinomiya, Kozo Yatani, Hikari, Eishi Kometani, Ibaraki, and Seiji Izuhara, Osaka Japan, assignors to Takeda Chemical Industries, Ltd., Higashi-ku, Osaka, Japan,

No Drawing. Filed Jan. 14, 1969, Ser. No. 791,192
Claims priority, application Japan, Jan. 18, 1968, 43/2,813
Int. Cl. A61k *15/00*
U.S. Cl. 424—175 23 Claims

Coloring of vitamin C compositions is prevented by

incorporating an effective amount, as an anti-coloring agent, of a mercaptopropionylglycine of the formula:



wherein R stands for H, acetyl or benzoyl and X for —OH or —NH_2, or a mixture of more than one of them, into a composition containing vitamin C.

3,781,424

HEMORRHOID TREATMENT PREPARATION PRODUCED FROM HOT CHERRY PEPPERS

Edwin K. Ponvert, 3713 Little Neck Point, Virginia Beach, Va. 23452

Continuation-in-part of application Ser. No. 656,700, July 28, 1967, which is a continuation-in-part of application Ser. No. 402,018, Oct. 6, 1964, both now abandoned. This application July 21, 1970, Ser. No. 56,826

Int. Cl. A61k *27/00*

U.S. Cl. 424—195 **9 Claims**

The present invention relates to a process, and the product thereof, whereby a new composition of matter is produced. This new composition of matter has no known chemical formula, it being a complex mixture of many chemicals of unknown organic structure. This new composition of matter, a soft solid residue of *Capsicum anuum*, is intended for oral administration in various forms, and prescribed dosages, to human beings suffering from hemorrhoids. Hemorrhoids, are not known to exist in animals. It is, therefore, intended as a hemorrhoidal remedy for the relief of hemorrhoids in mankind.

3,781,425

CONTROL OF INSECTS, NEMATODES AND ACARINAE WITH PHOSPHONYL-CARBAMYL-OXY-PHOSPHONATES

Henry Martin, Gellertstrasse 24, and Jozef Drabek, Herrengrabenweg 14, both of Basel, Switzerland

No Drawing. Original application Aug. 6, 1970, Ser. No. 61,819, now Patent No. 3,705,212. Divided and this application Nov. 14, 1972, Ser. No. 306,502

Claims priority application Switzerland, Aug. 11, 1969, 12,130/69

Int. Cl. A01n *9/36*

U.S. Cl. 424—204 **8 Claims**

2,2,2-trihalo - 1 - [O,O-dialkylphosphonylcarbamoyloxy]ethylphosphonic acid ester are very effective substances for combatting insects, nematodes, members of the order Acarina and plant-pathogenic bacteria and fungi. They may be applied in the form of pesticidal preparations.

3,781,426

PHOSPHORIC ACID ESTERS AND PESTICIDAL PREPARATIONS CONTAINING THEM

Ernst Beriger, Allschwil, and Ladislaus Pinter, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

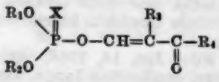
No Drawing. Original application July 24 1967, Ser. No. 655,289, now Patent No. 3,594,454. Divided and this application Mar. 9, 1971, Ser. No. 122,501

Claims priority application Switzerland, July 25, 1966, 10,735/66

Int. Cl. A01n *9/36*

U.S. Cl. 424—212 **10 Claims**

This invention relates to a compound of the formula



in which R_1 and R_2 are identical or different lower alkyl groups, X is an oxygen or a sulphur atom, R_3 represents a hydrogen atom, an alkyl group or a halogen atom and R_4 represents a lower alkoxy group, an alkyl group or an unsubstituted or substituted aryl group. The compounds are useful for combating insects and acarids.

3,781,427

PHOSPHORIC ACID ESTERS AND THEIR USE AS INSECTICIDES

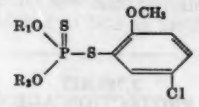
Ernst Beriger, Neuallschwil, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Original application Apr. 27, 1970, Ser. No. 32,414, now Patent No. 3,725,513. Divided and this application Jan. 17, 1973, Ser. No. 324,468

Int. Cl. A01n *9/36*

U.S. Cl. 424—217 **4 Claims**

Dithiophosphates of the formula



wherein R_1 and R_2 represent alkyl radicals of up to 4 carbon atoms are effective pesticidal, agents, preferably for combating insects, nematodes and members of the order Acarina. The dithiophosphates may be used in pesticidal preparations.

3,781,428

HYDROPHOBIC INSECTICIDAL COMPOSITIONS

Claude Hennart, Aubervilliers, France, and Laszlo Moldovanyi, Basel, and Willy Roth, Strengelbach, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 5, 1971, Ser. No. 104,059

Claims priority, application Luxembourg, Jan. 9, 1970, 60,170

Int. Cl. A01n *9/36*

U.S. Cl. 424—219 **24 Claims**

Hydrophobic insecticidal compositions comprising as essential components certain volatile phosphoric or thiophosphoric acid esters, at least one straight—or branched—chain higher alkane having at least 18 carbon atoms and having a vapor pressure at 20° C. of less than 0.001 torr, and a melting point of less than 120° C., and at least one incorporating agent which has a vapor pressure at 20° C. of less than 0.01 torr, and a melting point of less than 120° C. and which is selected from certain alkanones, certain alkenones, certain alkanophenones, certain halogenated alkanes, certain hydrocarbons and halogenohydrocarbons having at least one benzene nucleus and certain carboxylic acid esters of alkanols or alkanediols. These compositions are useful in evaporators for producing an atmosphere toxic to insects.

3,781,429

METHOD OF INHIBITING ULCEROGENESIS INDUCED BY NON-STEROIDAL ANTI-INFLAMMATORY AGENTS

Ruth Partridge, Pearl River, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Sept. 29, 1972, Ser. No. 293,710

Int. Cl. A61k *27/00*

U.S. Cl. 424—234 **9 Claims**

This disclosure describes the method of inhibiting the ulcerogenic effect induced by non-steroidal anti-inflammatory agents in mammals by administering orally the prostaglandins of the E series and certain 11-deoxy derivatives thereof and the prostaglandins of the A series.

3,781,430

DIURETIC FORMULATIONS

Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 800,260, Feb. 18, 1969, which is a continuation-in-part of application Ser. No. 538,532, Feb. 7, 1966, both now abandoned, which is a continuation-in-part of application Ser. No. 313,315, Oct. 7, 1963, now Patent No. 3,313,813, which in turn is a continuation-in-part of abandoned application Ser. No. 234,230, Oct. 30, 1962.

This application Dec. 21, 1971, Ser. No. 210,577

Int. Cl. A61k 27/00

U.S. Cl. 424—246 6 Claims

A potassium conserving diuretic, (3,5-diamino-6-chloropyrazinoyl)guanidine hydrochloride, is co-administered with a potassium excreting diuretic (ethacrynic acid and hydrochlorothiazide) to avoid hypokalemia in patients.

3,781,431

BENZOMORPHAN DERIVATIVES AS ANALGESIC AGENTS

Hans-Werner Schubert and Friedrich Hoffmeister, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

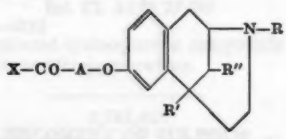
No Drawing. Original application May 14, 1970, Ser. No. 37,331. Divided and this application Sept. 27, 1972, Ser. No. 292,768

Claims priority, application Germany, May 17, 1969, P 19 25 296.1

Int. Cl. A61k 27/00

U.S. Cl. 424—267 22 Claims

An analgesic composition is produced which comprises an analgesically effective amount of a benzomorphan of the formula



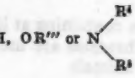
wherein

R is methyl, cyclopropylmethyl or cyclobutylmethyl;

R′ and R″ are the same or different, and are methyl or ethyl;

A is straight or branched chain alkylene or alkylidene of 1 to 4 carbon atoms or alkenylene of 2 to 4 carbon atoms, unsubstituted or substituted by phenyl or phenyl substituted by methyl, methoxy, chloro, nitro or acetylamino;

X is



wherein

R‴ is a straight or branched chain alkyl of 1 to 11 carbon atoms or straight or branched chain alkenyl of 2 to 11 carbon atoms, and

R^4 and R^5 are the same or different, and are hydrogen, alkyl of 1 to 4 carbon atoms, or R4 and R^5 together with the nitrogen atom form a pyrrolidine, piperidine or morpholine ring;

in combination with a pharmaceutically acceptable, nontoxic inert diluent or carrier. The composition may be administered orally or parenterally.

3,781,432

CORONARO-DILATING AND ANTIANOXEMIC MEDICINES

Roland Yves Mauvernay, Norbert Busch, Jacques Simond, and Jacques Moleyre, Riom, France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

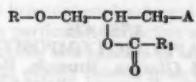
No Drawing. Continuation of abandoned application Ser. No. 749,277, Aug. 1, 1968. This application Aug. 23, 1971, Ser. No. 174,179

Claims priority, application France, Aug. 3, 1967, 116,738; Mar. 14, 1968, 143,676

Int. Cl. A61k 27/00

U.S. Cl. 424—250 9 Claims

A method of treating a patient to produce coronodilation and to provide anti-arhythmic activity, comprising administering to the patient a therapeutically effective dose of a compound having the formula



wherein

R is alkyl with 1 to 5 carbon atoms, alkenyl, alkynyl, phenyl, a nitro substituted phenyl, or arylalkyl,

R_1 is phenyl, methoxyphenyl, pyridyl, furyl, arylalkyl, or arylalkenyl,

A is morpholyl, N-methylpiperazinyl, or N-benzylpiperazinyl.

3,781,433

PIPERAZINYL-SUBSTITUTED-TRICYCLIC COMPOUNDS AS TRANQUILLIZERS

Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Application Jan. 18, 1971, Ser. No. 107,521, now Patent No. 3,692,788, dated Sept. 19 1972, which is a continuation-in-part of abandoned application Ser. No. 795,048, Jan. 29, 1969. Divided and this application July 13, 1972, Ser. No. 271,491

Int. Cl. A61k 27/00

U.S. Cl. 424—250 23 Claims

The compounds are 2-alkyl-4-(4′-substituted-1′-piperazinyl)-9,10-dihydro - 4H - benzo[5,6]cyclohepta[1,2-d] oxazoles and thiazoles; the substituents being methyl, ethyl or 2-hydroxyethyl, e.g. 2-methyl-4-(4′-methyl-1′-piperazinyl) - 9,10 - dihydro - 4H-benzo[5,6]cyclohepta-[1,2-d]oxazole. The compounds are useful therapeutically.

3,781,434

METHODS OF PRODUCING ANTIARTHRITIC ACTIVITY USING 3-SUBSTITUTED PHENYL-2-THIO-1,3-THIAZANE-2,4-DIONE

Charles E. Berkoff, Huntingdon Valley, Blaine M. Sutton, Hatboro, and Donald T. Walz, Drexel Hill, Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Filed Sept. 17, 1971, Ser. No. 181,610

Int. Cl. A61k 27/00

U.S. Cl. 424—246 4 Claims

Pharmaceutical compositions having antiarthritic activity which comprise a 3-substituted phenyl-2-thio-1,3-thiazane-2,4-dione and methods of producing antiarthritic activity by administering internally said compositions.

3,781,435

STEROID ANAESTHETICS

Benjamin Davis, Chalfont St. Peter, Derek Roger Pearce, Bracknell, and Gordon Hanley Phillipps, Wembley, England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

No Drawing. Original application June 17, 1970, Ser. No. 47,163, now Patent No. 3,714,352, dated Jan. 30, 1973. Divided and this application Jan. 5, 1973, Ser. No. 321,274

Claims priority, application Great Britain, June 20, 1969, 31,371/69

Int. Cl. A61k *17/00*

U.S. Cl. 424—239 37 Claims

There are disclosed anaesthetic compositions for parenteral administration comprising an aqueous solution containing at least 1 mg./ml. of 3α-hydroxy-5α-pregnane-11,20-dione, at least 1% by weight of a non-ionic surfactant, and as solubility promoter a 3α-hydroxy-5α-pregnane-11,20-dione having at the 21-position a lower alkanoyloxy, hemisuccinyloxy or benzoyloxy group.

3,781,436

THERAPEUTIC COMPOSITIONS

Cornelia Edmond Giurgea, Brussels, Belgium, assignor to UCB, Societe Anonyme, Saint-Gilles-lez-Brussels, Belgium

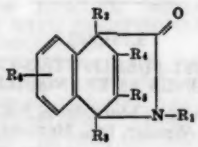
No Drawing. Filed Oct. 20, 1971, Ser. No. 191,063

Claims priority, application Great Britain, Oct. 22, 1970, 50,215/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 8 Claims

A pharmaceutical composition comprising a pharmaceutical excipient and a therapeutically effective amount of a 1,4 - dihydro-1,4-etheno-isoquinolin-3(2H)-one having the formula



wherein R_1, R_2, R_3, R_4 and R_5 are each a member selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, said alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, aryl and aralkyl; and R_6 is a member selected from the group consisting of hydrogen, halogen, alkyl and alkoxy having 1 to 4 carbon atoms and trifluoromethyl.

3,781,437

1,2,3,4,8,9-HEXAHYDRO - 3 - METHYLPYRIDOL [4',3':2,3]INDOLO[1,7-ab] [1]BENZAZEPINE AND THE 3-ETHYL HOMOLOG AS TRANQUILIZERS

Alan A. Rubin, Rockville Centre, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 170,991, Aug. 11, 1971. This application June 2, 1972, Ser. No. 258,955

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 7 Claims

Two known compounds, 1,2,3,4,8,9-hexahydro-3-methylpyrido[4',3':2,3]indolo[1,7 - ab][1]benzazepine and 3-ethyl - 1,2,3,4,8,9-hexahydropyrido[4',3':2,3]indolo[1,7-ab][1]benzazepine, are effective both as minor tranquilizers (anxiolytics) and as major tranquilizers (antipsychotics). As minor tranquilizers they are effective at non-ataxic doses, and are not likely to cause addiction when abused. Addition salts of these compounds with pharmaceutically acceptable organic or inorganic acids can be used with the same effect.

3,781,438

ARYLISOXAZOLES AS NEMATICIDES

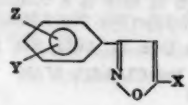
Loren Kenneth Gibbons, Medina, N.Y., assignor to FMC Corporation, New York, N.Y.

No Drawing. Filed Mar. 27, 1972, Ser. No. 238,613

Int. Cl. A01n *9/22, 9/28*

U.S. Cl. 424—272 9 Claims

Nematicidal compositions are described which have as the nematicidal component thereof an arylisoxazole of the formula:



wherein X is chloro, bromo or cyano, Y is hydrogen, fluoro, chloro, bromo, cyano, lower alkyl or lower alkoxy and Z is hydrogen, chloro or methyl.

3,781,439

PHARMACEUTICAL COMPOSITION HAVING ANALGESIC AND ANTIPHLOGISTIC ACTIVITIES

Giorgio Zoni, Milan, Italy, assignor to Italfarmaco S.p.A., Milan, Italy

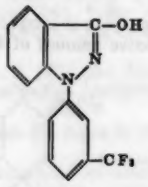
No Drawing. Filed Feb. 25, 1971, Ser. No. 118,938

Claims priority, application Italy, Dec. 15, 1970, 33,026/70

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 5 Claims

1-(m-trifluoromethylphenyl)-3-hydroxy-1H-indazole of the formula:



as well as pharmaceutical compositions containing it as the active ingredient have been found to have analgesic and antiphlogistic activities

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3,781,440

ANIMAL FEED COMPOSITIONS AND METHODS

Gino J. Marco, Webster Groves, Mo., and Robert B. Grainger, Palm Desert, Calif., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,957

Int. Cl. A61k *27/00*

U.S. Cl. 424—300 13 Claims

Feed compositions containing at least one compound of the class of thiolcarbamates are useful for improving the growth response in animals.

3,781,441

USE OF 4-CHLORO-3,5-DINITROBENZENESULFONAMIDE AS A FUNGICIDE

Jerry H. Collins, Elizabeth, N.J., assignor to Esso Research and Engineering Company

No Drawing. Original application May 1, 1970, Ser. No. 33,859, now abandoned. Divided and this application Jan. 17, 1972, Ser. No. 218,611

Int. Cl. A01n *9/16*

U.S. Cl. 424—321 1 Claim

Soil fungi are controlled with 4-chloro-3,5-dinitrobenzenesulfonamide.

3,781,442

BROMOACETANILIDES USEFUL AS BIOCIDES

Don R. Baker, Pinole, and Eugene G. Teach, El Cerrito, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Mar. 12, 1969, Ser. No. 806,717, now abandoned. Divided and this application Mar. 24, 1971, Ser. No. 127,774

Int. Cl. A61k *27/00*

U.S. Cl. 424—324 3 Claims

Bromoacetanilides as new compositions and their activity as microbiocides. Representative compounds include 3'-hydroxy bromoacetanilide, 3'-(N-methylcarbamoyloxy) bromoacetanilide, 3'-(N-isopropylcarbamoyloxy) bromoacetanilide, 3'-(N-allylcarbamoyloxy) bromoacetanilide and 4'-hydroxy bromoacetanilide.

3,781,443

PHENETHANOLAMINE N-METHYL TRANSFERASE INHIBITING BENZYLAMINES

Ray W. Fuller and Bryan B. Molloy, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,315

Int. Cl. A61k *27/00*

U.S. Cl. 424—330 6 Claims

The enzymatic activity of phenethanolamine N-methyl transferase (PNMT) in effecting the N-methylation of norepinephrine is inhibited by contacting the PNMT with certain benzylamines.

3,781,444

HYPOCHOLESTEROLEMIC COMPOUNDS

Bobby R. Ezzell, Houston, Tex., Eugene R. Fluck, Berwyn, Pa., and Louis R. Haefele, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

No Drawing. Continuation-in-part of abandoned application Ser. No. 105,076, Jan. 8, 1971. This application Nov. 12, 1971, Ser. No. 198,445

Int. Cl. A61k *27/00*

U.S. Cl. 424—331 3 Claims

Benzyl-substituted cyclooctanone compounds which exhibit hypocholesterolemic properties.

3,781,445

RECOVERY OF SULPHUR

Gerald Moss and Dennis F. Rosborough, Oxford, England, assignors to Esso Research and Engineering Company

Continuation of abandoned application Ser. No. 861,779, Sept. 29, 1969. This application Dec. 10, 1971, Ser. No. 206,808

Int. Cl. C01b *17/04*

U.S. Cl. 423—574 2 Claims

Tail gas from a Claus unit is contacted with a bed of fluidized sulphur reactive material such as lime under oxidizing conditions in an absorber in order to remove sulfur compounds therein. Essentially sulphur-free gas is discharged from the absorber. Absorber bed material containing sulfate (e.g., $CaSO_4$) is transferred to a regenerator where the corresponding oxide (e.g., CaO) is regenerated under reducing conditions.

3,781,446

CARBAMYLOXYBENZYLIDENEMALONONITRILE INSECTICIDES

Roger P. Cahoy and John Sanjean, Overland Park, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Original application Sept. 8, 1970, Ser. No. 70,529, now Patent No. 3,694,483. Divided and this application May 11, 1972, Ser. No. 252,205

Int. Cl. A01n *9/20*

U.S. Cl. 424—300 5 Claims

The carbamyl derivatives of 4-hydroxy-3,5-di-tert.butyl benzylidenemalononitrile are compounds which possess a high order of activity as miticides, insecticides and fungicides. New compounds of this class, for example, 3,5-di-tert.butyl - 4 - (3-bromophenylcarbamyloxy)benzylidenemalononitrile, are particularly effective against corn rootworm while possessing less toxicity to warm blooded animals than the most closely related prior art compound.

3,781,447

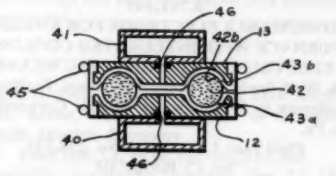
METHOD AND APPARATUS FOR PRODUCING AN ANNULAR SKINLESS SAUSAGE PRODUCT

Thomas Durso, 8111 Gross Point Road, Morton Grove, Ill. 60053

Continuation-in-part of abandoned application Ser. No. 791,368, Jan. 15, 1969. This application Feb. 12, 1971, Ser. No. 114,956

Int. Cl. A22c *11/00*

U.S. Cl. 426—513 9 Claims



A method and apparatus for the manufacture of annular skinless sausage products by placing sausage batter into a pair of cooperating molds, locking the molds together, cooking the batter, and removing the annular sausage product from the molds. In the illustrated embodiment, air pressure is used to free the sausage from the mold.

ELECTRICAL

3,781,448

ELECTRIC SLAG REFINING PROCESS AND APPARATUS

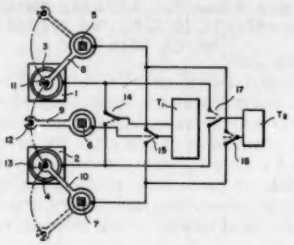
Wolfgang Holzgruber, Kapfenberg; Peter Machner, Leoben; Adolf Schneihofer, Kapfenberg; Otmar Kleinhagauer, Kapfanberg, and Peter Cerwenka, Kapfenberg, all of Austria, assignors to Gebr. Bohler & Co. AG., Vienna, Austria

Filed June 6, 1972, Ser. No. 260,122

Claims priority, application Austria, June 9, 1971, 4973

Int. Cl. H05b *3/60*

U.S. Cl. 13—12 **3 Claims**



To produce an ingot consisting of a metal alloy, substantially the entire ingot is formed in an ingot mold by fusing down remelting electrode material in a liquid slag bath contained in said mold while electric a.c. power is supplied to said slag bath from first a.c. transformer means. The ingot in said mold is subsequently subjected to top end heating in that electric a.c. power is supplied to said liquid slag bath from second a.c. transformer means having a lower nominal power than said first transformer means.

3,781,449

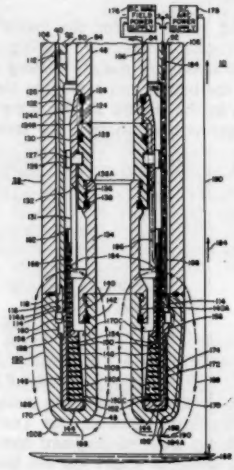
NONCONSUMABLE ELECTRODE FOR AN ELECTRIC ARC FURNACE WITH INTEGRATED COOLING AND ELECTRICALLY CONDUCTING MEANS

Charles B. Wolf, Irwin, and Ronald R. Akers, Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 1, 1972, Ser. No. 258,731

Int. Cl. H05b *7/08*

U.S. Cl. 13—18 **38 Claims**



An electrode suitable for providing an electrical arc between the tip of the electrode and a melt in an electric furnace. The tip of the electrode upon which the arc plays also includes an electromagnetic coil which is used to move the arc over the entire circumferential area of the tip of the electrode by magnetic influence. Consequently, no single small section of the tip of the electrode becomes overheated. The heat generated both at the point of arc attachment to the tip and within the magnetic field coil creates a heat flux which must be removed to maintain the integrity of these parts. A channel is provided to conduct cooling fluid, such as water, simultaneously to both the tip and the electromagnetic coil to cool them. In addition, a portion of the electrode includes an electrical conductor which acts as a common conductor for the electrical power supply for the electromagnetic coil and for the arc producing tip of the electrode. This conductor also forms part of the cooling path.

3,781,450

SIGNAL-SELECTING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

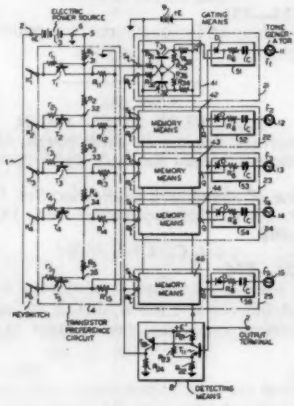
Takatsugu Nakajima, Neyagawa-shi, Osaka-fu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 7, 1972, Ser. No. 311,728

Claims priority, application Japan, Dec. 13, 1971, 46-101311

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.01 **4 Claims**



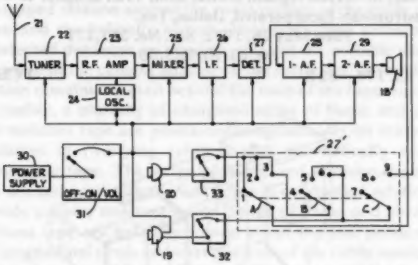
A signal selecting system for an electronic musical instrument comprising tone generators, gating means, keyswitches and a transistor preference circuit. The transistor preference circuit comprises a plurality of bias resistors, a plurality of transistors and a plurality of base resistors for the respective transistors. The transistors are controlled by the keyswitches so as to produce control voltages at the collectors thereof, respectively, whereby when one or more keyswitches are simultaneously closed, only one transistor is conductive and so the corresponding gating means is actuated so as to select preferentially only one output tone signal.

3,781,451

GUITAR, RADIO, MICROPHONE COMBINATION WITH SELF-CONTAINED ENERGY SOURCE AND AMPLIFIER

Frank D. Nolan, Clinton, Ind., assignor to Bruno Contri, Clinton, Ind.

Filed Dec. 7, 1972, Ser. No. 312,859
Int. Cl. G10h 1/00
U.S. Cl. 84—1.16 8 Claims



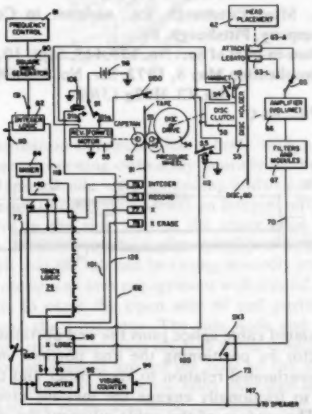
A musical instrument which has a guitar, radio and microphone connected to a source of electrical energy and to a single amplifier. The main body of the guitar is hollow having a battery pack and radio mounted therein. A microphone is mounted to the main body of the guitar and is connected to the battery pack and to the amplifier of the radio. Means are mounted to the main body beneath the guitar strings for producing audio electrical signals in proportion to the sounds generated by the strings. The means are connected to the radio amplifier. Switches are mounted to the main body and are connected to the radio, microphone and means for allowing the musician to selectively connect the microphone, guitar and radio together for producing a combined sound through the radio speaker or alternatively for operating only the microphone or the microphone and guitar.

3,781,452

METHOD AND APPARATUS FOR ASSEMBLING RECORDINGS OF MUSICAL SCORES

Andre C. Vauclain, 20 Old Gulph Rd., Gladwyne, Pa.

Filed Jan. 6, 1972, Ser. No. 215,875
Int. Cl. G10h 3/00
U.S. Cl. 84—1.28 18 Claims



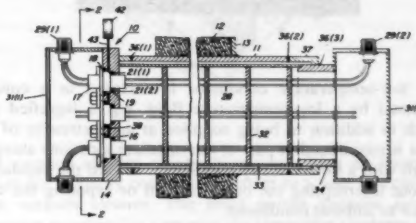
A complete musical score is recorded from stored pitches and notes by first recording basic timing signals for the entire score on a first track of a multi-channel tape, and then recording separately the part of each instrument involved in the score, note by note, on a separate track, and referenced in time to the basic timing signals. The different instrument recordings are combined, through a sequence of mixing operations, to provide a single track compilation of the entire score.

3,781,453

ELECTRICAL PENETRATION ASSEMBLY

Forrest E. Funk, San Jose; Richard T. Oda, Sunnyvale; Norman G. Luria, and Edward G. Margherone, both of San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 12, 1972, Ser. No. 243,310
Int. Cl. G21c 13/02
U.S. Cl. 174—11 R 24 Claims



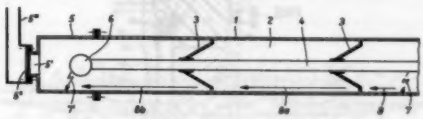
An assembly of double-sealed modules for passing electrical conductors through the wall of a vapor and pressure sealed containment vessel.

3,781,454

ELECTRIC HIGH-TENSION CONDUCTOR ASSEMBLY

Willi Olsen, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 13, 1972, Ser. No. 314,561
Claims priority, application Germany, Dec. 23, 1971, P 21 65 283.5
Int. Cl. H02g 15/22; H01b 9/04, 9/06
U.S. Cl. 174—11 R 9 Claims



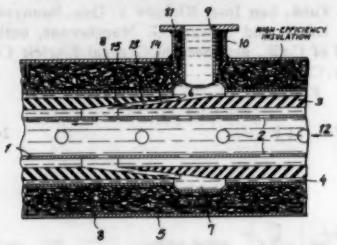
An electric high-tension conductor assembly includes an electric conductor which carries a high-voltage current and a grounded electrically conductive enclosure surrounding this conductor with the latter spaced from the inside of this enclosure, the conductor and enclosure being elongated and the enclosure having an end cap in which the conductor has a terminating end spaced therein. Provision is made to assure that any arc formed between the conductor and the enclosure travels to that terminating end of the conductor and stays there. The enclosure's end cap is made safely resistant to the stationary arc. Therefore, the enclosure itself may be made on non-magnetic metal, to prevent excessive eddy current losses, with a wall thickness and/or composition only safely adequate to be resistant to the traveling arc.

3,781,455

LOW-TEMPERATURE CONDUCTOR ARRANGEMENT

Ullrich Hildebrandt, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed June 20, 1972, Ser. No. 264,562
Claims priority, application Germany, June 21, 1971, P 21 30 692.3
Int. Cl. H01v *11/00*
U.S. Cl. 174—15 C 14 Claims



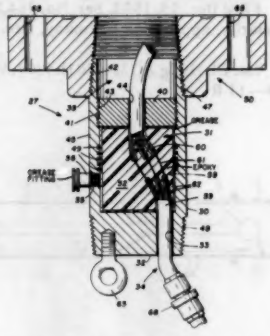
A low-temperature conductor is enclosed in a conduit traversed by a low-temperature fluid, e.g. a liquefied gas, which in addition to being supplied at any extremity of the cable is introduced in part at intermediate locations along its length with a flow-velocity component toward the conductor without interrupting the outer conduit or exposing the conductor to ambient conditions.

3,781,456

PRESSURE SEALED CABLE PACKOFF AND METHOD FOR MAKING AND USING SAME

Charles R. Knowles, Anchorage, Alaska, and Douglas J. Ruckel, Corpus Christi, Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 1, 1972, Ser. No. 277,057
Int. Cl. E21b *33/00*; H02g *15/00*
U.S. Cl. 174—23 R 9 Claims



Apparatus for feeding a multi-conductor cable through a wall separating two environmental zones, such as pressure zones of a Christmas tree of a wellhead, includes a hollow body inserted through the wall separating the zones. The hollow body is filled with epoxy and a pressurized packing material forced into nonconducting interfaces between the epoxy and the hollow body. Conductor spacers are provided in one embodiment to prevent the conductors of the cable from shorting.

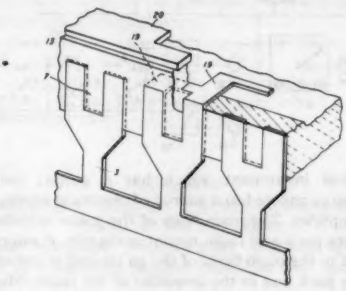
Also presented is a method for achieving a seal in effecting a cable feedthrough from one environmental zone to another including running the cable through an enclosure defining body, removing the insulation from the wires within the enclosure, filling the enclosure with a hardening cement or resin, such as epoxy, exposing the enclosure to a fluid under pressure, and injecting, under a higher pressure, a packing material into the nonjoined interfaces between the epoxy and the walls of the enclosure.

3,781,457

GLASS DUAL-IN-LINE HEADER

Michael H. McKerreghan, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 26, 1972, Ser. No. 257,271
Int. Cl. H05k *5/00*
U.S. Cl. 174—52 S 2 Claims



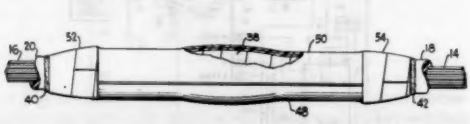
The disclosure relates to a glass or ceramic filled glass dual-in-line header wherein the leads on the lead frame extend perpendicular to the plane of the glass and closely adjacent the sides of the glass during fabrication. The leads of the lead frame are bonded to the glass along three surfaces thereof to provide superior standoff sheer reliability and resistance to header cracking, resulting in loss of hermeticity. The glass on the upper surface of the lead frame extends to the edge of the header. A larger cavity for reception of a semiconductor chip is provided due to smaller lead lengths on the glass surface. The leads of the lead frame include a window which extends within the glass and outwardly, thereby providing a seal within the window to provide stronger lead anchoring and to provide the header with better stress capability.

3,781,458

INSULATED CABLE SPLICE AND METHOD FOR MAKING THE SAME

Francis A. May, Pittsburgh, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 179,445, Sept. 10, 1971. This application May 8, 1972, Ser. No. 250,889
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 C 4 Claims



The insulated cable splice joins the end portions of a metallic conductor by positioning the end portions in a metallic sleeve in overlapped relation to each other and the sleeve is deformed to frictionally engage the metallic conductor end portions. The surface of the cable adjacent the exposed end portion of the metallic conductor is buffed and thereafter the exposed end portions of the conductors on opposite sides of the metallic sleeve are helically wrapped with a tape to com-

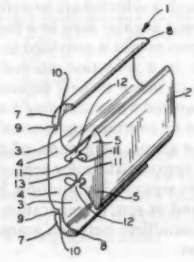
press the conductor strands adjacent to the edges of the cable insulation. The recessed portion in the splice formed between the edges of the cable insulation is filled with an elastomeric filler material, preferably by helically winding a strip of elastomeric filler material over the exposed conductor end portions and the metallic sleeve. The outer surface of the filler material has a diameter slightly larger than the diameter of the sheath of insulation on the conductor. A liquid cement is applied to the outer buffed surface of the cable insulation and over the filled recessed portion between the edges of the cable insulation. A strip of elastomeric tape is helically wound in overlapped relation around the outer surface of the cable insulation and the helically wound elastomeric tape extends for preselected distances on opposite sides of the metallic sleeve. A portion of the cement applied on the surface of the cable insulation remains exposed beyond the ends of the tape winding. Thereafter, a plurality of elongated strips of flame and abrasion resistant tape are positioned longitudinally on the cable insulation in overlying relation with the helically wound elastomeric tape. The strips of flame and abrasion resistant tape are arranged with the side edges in overlapped relation to provide a water resistant splice. Strips of flame and abrasion resistant tape are helically wound about the end portions of the longitudinal strips and over portions of the cable insulation having the exposed layer of cement thereon to seal the ends of the splice. The above described helically wound elastomeric tape and plurality of strips of longitudinally positioned abrasion resistant tape may also be employed to repair damaged insulation on a cable where the conductor does not require splicing.

3,781,459

COMPRESSION CONNECTOR FOR ELECTRICAL CONDUCTORS

Vernon E. Peek, Birmingham, Ala., assignor to Anderson Electric Corporation, Leeds, Ala.

Filed July 20, 1972, Ser. No. 273,468
Int. Cl. H02g *15/08*
U.S. Cl. 174—94 R **11 Claims**



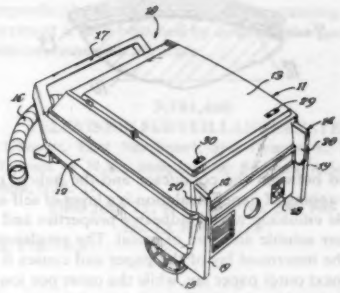
The compression connector has a body with a conductor receiving recess opening outwardly laterally of the body and defined by spaced side walls extending endwise of the body. The outer edge of one side wall has an integral tab. A longitudinal groove in the side wall at the inner edge of the tab reduces the thickness of the wall to provide a hinge-like connection such that the tab can be swung inwardly into the open side of the recess and into engagement with a conductor in the recess so as to close the open side of and partially fill the recess around the conductor. The side walls and tab can be distorted into tight embracing relation to the conductor by die crimping forces applied toward the base of the recess. Longitudinal slots are provided in the body and open laterally into the bottom of the recess and slope outwardly from each other in a direction away from the base of the recess. The connector, with a given size recess, can connect to conductors throughout a wide range of diameters.

3,781,460

VACUUM CLEANER CONSTRUCTION

George A. Westergren; Warren H. Fish, both of White Bear Lake; Stanley R. Crooks, Shakopee, and David G. Koland, Sandstone, all of Minn., assignors to Whirlpool Corporation, Benton Harbor, Minn.

Filed June 13, 1972, Ser. No. 262,360
Int. Cl. H05k *5/02*
U.S. Cl. 174—52 R **12 Claims**



A vacuum cleaner construction comprising an improved means for pivotally connecting a cover to a base in a canister type vacuum cleaner. The pivot means includes integral camming structure for camming the connector elements apart to release the cover from the base as an incident of a forceful urging of the cover beyond the normal open position. Removable switch and light means are mounted on the cover adjacent the pivot means.

3,781,461

CABLE SPLICE ASSEMBLY AND METHOD

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Continuation-in-part of Ser. No. 76,758, Sept. 30, 1970, abandoned. This application Mar. 30, 1972, Ser. No. 239,522
Int. Cl. H02g *15/18*
U.S. Cl. 174—93 **6 Claims**

A versatile, readily expandable cable splice assembly and method utilizing a high strength conductive member to interconnect the electrical shields of the cable ends and additionally to transfer cable tension forces across the splice independently of the splice conductors. The assembly includes a plurality of components designed for telescopic assembly to provide a splice enclosure of resilient non-conductive split tubes chargeable with potting compound of either the setting or non-setting type. If the latter type is employed, the splice assembly may be re-entered whenever it is desirable for servicing or the addition of branchout service lines to customers served by the cable.

3,781,462
PAPER-INSULATED ELECTRICAL CONDUCTOR AND METHOD OF MAKING SAME

Adrian Y. Santos, Yonkers, and Charles Feder, Riverdale, both of N.Y., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

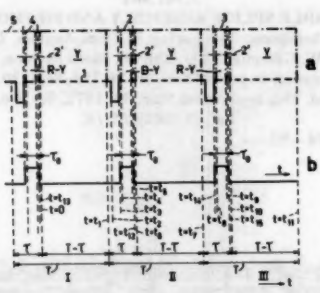
Filed May 25, 1972, Ser. No. 256,896
Int. Cl. H01b *7/02*
U.S. Cl. 174—121 B **3 Claims**

Interposed between the conductor and the helical or longitudinal wrapping of paper insulation is a layer of self-setting, heat sealable emulsion having adhesive properties and which is inert, water soluble and free of metal. The emulsion is absorbed by the innermost lay of the paper and causes it to adhere to the next outer paper lay, while the outer portion of the paper which is not exposed to the saturated portion remains loosely formed around the conductor. Upon drying of the paper insulation, the solid portion of the emulsion remains as a film on the periphery of the conductor and the innermost surface of the paper.

3,781,463
COLOUR TELEVISION CIRCUIT

Willem Van den Bussche, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 18, 1971, Ser. No. 199,975
Claims priority, application Netherlands, Nov. 28, 1970, 7017427
Int. Cl. H04n *7/12, 9/02*
U.S. Cl. 178—5.4 CD **20 Claims**



A colour television system particularly intended for video recording in which two chrominance signals are transmitted line-sequentially in a time-compressed form during the line blanking period, preferably during the back porch of the line synchronisation. To this end they must be slowly written in and quickly read out in a bucket-brigade delay line by means of write and read control signals.

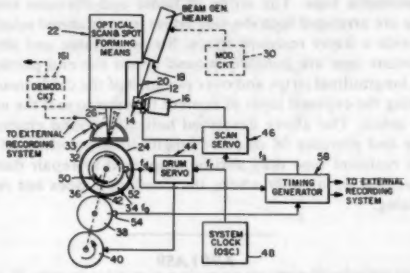
Two series-arranged bucket-brigade delay lines are provided at the receiver end, the first receiving the incoming signal and writing in and reading out this signal by means of write and read control signals. Said write and read control signals at the receiver end have the same frequencies as the read and write control signals, respectively, at the transmitter end. The output of the first bucket-brigade delay line is a direct output, but it is also connected to the input of the second bucket-brigade delay line to which a control signal is applied mainly during the line scan period, which control signal has the same frequency as the write control signal at the transmitter end.

The luminance signal is processed, with the required delay, in parallel with the chrominance signal.

3,781,464
LIGHT SCANNING APPARATUS AND METHOD FOR CONVERTING DISPLAY INFORMATION INTO STORABLE VIDEO DATA

Samuel Bousky, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 17, 1972, Ser. No. 218,200
Int. Cl. H01j *29/70*
U.S. Cl. 178—5.4 ES **11 Claims**



A display scanner system and method selectively scans a reflective display surface, and provides conversion of the display information to storable video signals. The system is responsive only to the diffuse reflection of the reflected light from the display surface, but not to the specular reflection therefrom. A motor driven, optical scan device converges one or more beams to respective focused spot or spots, while directing same through a selected arc to define a scan line, and also converts the input angular scan to a flat field scan. Selectively movable support means is provided to support and move the display surface in a direction normal to the scan line direction, and also to index to new positions along the line scan direction as required when scanning a wide display with a plurality of adjacent or overlapping rows of scan lines. In the color embodiment a group, or groups, of three light sensors are employed, with appropriate color separation filters to provide color video data signals. The multiple beam embodiment employs temporal and/or spacial separation of beams, to provide a reduction in deadtime between scans, and/or to obtain interlace information.

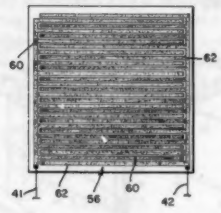
3,781,465
FIELD SEQUENTIAL COLOR TELEVISION SYSTEMS

Michael N. Ernstoff, Mar Vista; Eric R. Fehr, Los Angeles; William C. Hoffman, and Richard N. Winner, both of Torrance, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 8, 1972, Ser. No. 232,891
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 BD **3 Claims**

A high brightness field sequential color telvision display system utilizing electronically controllable color switching of a tri-color liquid crystal filter positioned in front of a monochrome cathode ray tube. The liquid crystal structure provides a color change in response to electronic pulses and color switching is the result of an orientation aligned in the direction of the light path or in a direction substantially normal to the light path. The orientation of the host crystal domain results in a similar orientation of associated dye

domains or molecules. For each of the basic red, green and blue colors, a field sequential operation is performed by applying switching pulses so that a field is provided normal to the direction of the light path in a liquid crystal cell of the selected color. To rapidly clear a selected cell to a clear state, a field is



applied substantially parallel to the light path. The color image is formed in the field sequential fashion by placing the spectral filter in front of a cathode ray tube and observing the various intensities of white light on the face of the tube through the composite filter.

3,781,466

INFORMATION STORAGE APPARATUS

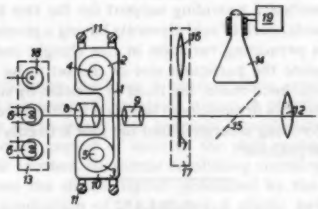
Kenneth Robson Brown, Midlothian, Scotland, assignor to Ferranti Limited, Hollinwood, Lancashire, England

Filed Apr. 11, 1972, Ser. No. 242,929

Claims priority, application Great Britain, Apr. 13, 1971, 9214/71.

Int. Cl. H01j *29/89*; H04n *1/24*

U.S. Cl. 178—6.8 **7 Claims**



Information storage apparatus for use as a back-up store for a moving-map display has the information encoded onto part of the film carrying the map charts. To read the information the optical system is modified so that the information is scanned by a flying-spot scanner.

3,781,467

METHOD AND APPARATUS FOR MEASURING THE LENGTH OF ELONGATE FEATURES HAVING A SUBSTANTIALLY COMMON ORIENTATION EMPLOYING LINE SCANNING

Michael Richard Soames, Fulbourn, England, assignor to Image Analysing Computers Limited, Melbourn Nr. Royston, Hertfordshire, England

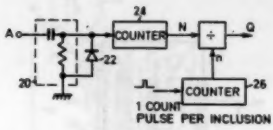
Filed Apr. 27, 1972, Ser. No. 248,244

Claims priority, application Great Britain, Apr. 28, 1971, 11,822/71

Int. Cl. G01n *21/32*, *15/02*; H04n *7/18*

U.S. Cl. 178—6.8 **5 Claims**

A method and apparatus is described for measuring the length of elongate features having a substantially common orientation in which a video signal is obtained by line scanning and measurements are made on the video signal of electrical pulses derived therefrom by detection. Contrary to conventional practice the method of the invention proposes that the field containing the features be orientated so that the features



are perpendicular to the direction of line scanning. The length measurement is then obtained by counting the number of line scan intersections with a feature.

3,781,468

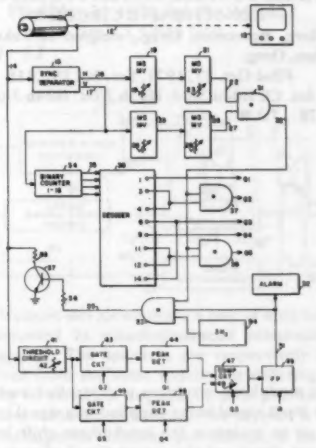
TELEVISION SURVEILLANCE SYSTEM

Marc Chomet, East Northport, and Donald E. Ellison, Sea Cliff, both of N.Y., assignors to Sanders Associates Inc., Nashua, N.H.

Filed June 21, 1972, Ser. No. 265,105

Int. Cl. H04n *7/18*

U.S. Cl. 178—6.8 **7 Claims**



A surveillance system is described in which a television camera views the general scene under surveillance and in which the magnitude of the video signal pertaining to a preselected portion thereof and occurring during one or more fields is stored and compared with a reference signal or with the magnitude of the video signal pertaining to the same preselected portion and occurring during one or more subsequent fields, whereby, in either case, a difference in magnitude in excess of a predetermined threshold is indicative of the motion of an object in such portion.

3,781,469

OPTIC RELAY FOR SCANNING BY MEANS OF A LIGHT BEAM

Jacques Donjon, Yerres, and Gerard Joseph Marcel Marie, L'Hay-les-Roses, both of France, assignors to U. S. Philips Corporation, New York, N.Y.

Filed July 14, 1971, Ser. No. 162,565

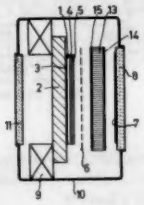
Claims priority, application France, July 17, 1970, 7026419

Int. Cl. H04n *3/02*, *9/14*

U.S. Cl. 178—7.3 D **2 Claims**

An optic relay comprising a double refracting crystalline

plate which can be varied by the Pockels effect, the signal being applied between two transparent layers.



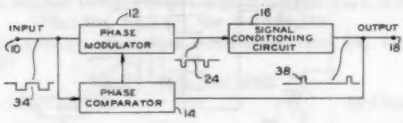
According to the invention the scanning of one of the faces of the plate is realized by a light beam acting on a photoemissive layer or a photoconductive layer.

3,781,470

PHASE CONTROL SYSTEM FOR SIGNAL CONDITIONING CIRCUITS

John J. Horn, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 27, 1971, Ser. No. 192,818
Int. Cl. H04n *5/04*; **H03b** *3/04*; **H04b** *3/04*
U.S. Cl. 178—7.3 R **7 Claims**



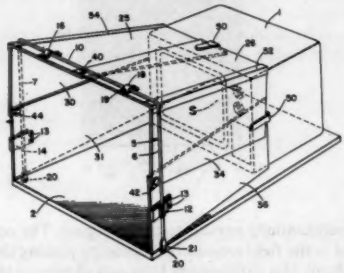
A phase modulator produces a controlled variable phase shift in the input signal being supplied to a signal conditioning circuit so as to maintain the total phase shift between the original input signal and the output signal of such circuit at a predetermined constant value, even though such circuit itself produces undesirable or spurious and unpredictable varying phase shifts in the signal being modified due to changing circuit conditions such as changes in temperature of components in the circuit, changes in current flow through such components or changes in voltage applied to such components. A phase comparator compares a portion of the output signal of the signal conditioning circuit with a portion of the input signal and supplies a control voltage to the phase modulator. This control voltage causes the phase modulator to vary the phase shift of the input signal in a direction resulting in such constant phase shift. The disclosed signal conditioning circuit is a horizontal deflection circuit for a television monitor. In the phase comparator, a selected portion of blanking pulses at the output of the deflection circuit and a selected portion of alternate cycles of a symmetrical square wave from a horizontal oscillator are employed to set and reset a gating multivibrator to produce an unsymmetrical square wave which gates an integrator. The output of the integrator is a control voltage which varies with any variations in the time interval between such selected portions of the blanking pulse and input signal. The circuit shown may also include a synchronizing circuit for synchronizing the horizontal oscillator with synchronizing pulses derived from a television signal.

3,781,471

TELEVISION SCREEN LIGHT SHIELD

Charles C. Hoffberger, II, 200 Cross Keys Rd., Baltimore, Md., and Charles A. Rivlin, 2245 Regene Dr., Baltimore, Md.

Filed Dec. 27, 1972, Ser. No. 319,005
Int. Cl. H01j *24/06*; **H04n** *5/64*
U.S. Cl. 178—7.82 **9 Claims**



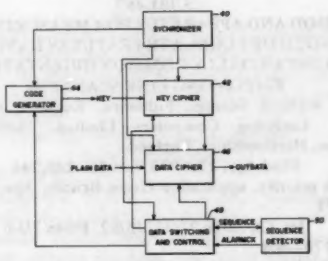
An extremely simple and inexpensive light shield or shroud for television screens, adjustable in nature, for encircling the screen of a television set (or the front end of the set itself), thus enabling viewing of the screen in sunlight or other areas where excessive light reduces the contrast in the screen such as to otherwise prevent adequate viewing. In collapsed form, the shield lies flat for shipment or storage purposes, yet it can be readily pivoted in place, with the two adjustable sides being raised, together with the top, and then conformed in dimension to the top and sides of the television set, thus to adequately shield the screen from sunlight (or artificial glare) by the resultant enclosure. The entire assembly is pivoted to a baseboard upon which the set rests, a pivoted frame attached to said baseboard providing support for the two top and two side elements, each of said elements having a pivoted, adjustable means permitting variation in size (height and width) to accommodate the particular size of the set to be used. Such adjustments, once made, are fixed in position by suitable clips and/or a pin-slot arrangement having a built-in retention ability, thus providing assurance that the unit is fixedly maintained in adjusted position.

3,781,472

DIGITAL DATA CIPHERING TECHNIQUE

George E. Goode, Richardson; Barrie O. Morgan, and Kenneth M. Branscome, both of Dallas, all of Tex., assignors to Datotek, Inc., Dallas, Tex.

Filed Apr. 15, 1971, Ser. No. 134,319
Int. Cl. H04l *9/04*; **H04k** *1/00*
U.S. Cl. 178—22 **21 Claims**



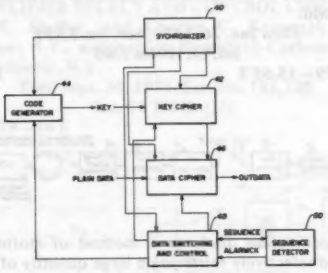
The specification discloses a ciphering system for providing security to digital transmission. To encode with the system, a

clear text signal is clocked through a binary counter for a number of steps determined by a limit signal derived by a pseudorandom digital signal. To prevent transmission of clear text in case of a malfunction of the system, the clear text is compared with the ciphered output text and an alarm indication is generated upon correspondence of the clear text and the ciphered text for a predetermined number of digital bits. The alarm circuitry is checked and is required to be operative before the ciphering system may be operated. Speed trap circuitry prevents the system from being operated above a preselected frequency to reduce the possibility of breakdown of the system code by high speed analyzation procedures.

3,781,473
RANDOM DIGITAL CODE GENERATOR

George E. Goode, Richardson, and Kenneth M. Branscome, Dallas, both of Tex., assignors to Datotek, Inc., Dallas, Tex.

Filed Apr. 15, 1971, Ser. No. 134,320
Int. Cl. H04k *1/00*; H04l *9/04*
U.S. Cl. 178—22 **27 Claims**



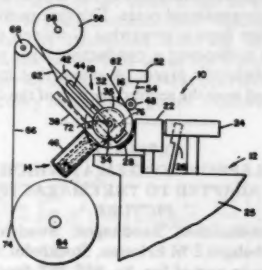
The specification discloses a random code generator for generating a randomized digital key stream. A plurality of shift registers are each operable to generate a randomized digital signal, the cycle period of each of the shift registers being prime to one another. Nonlinear combining circuitry receives and combines the digital signals generated by the shift registers for production of a randomized digital key stream. Mode control circuitry is responsive to the key stream for randomly varying the interconnection and mode of operation of the shift registers between a plurality of different modes. Circuitry is also responsive to the key stream for randomly varying the number of steps taken by the shift registers during the various modes of operation. The shift registers are operable during a priming mode to generate a random prime signal for synchronization of encoding and decoding ciphering devices. If desired, a read only memory may be connected into the generator to further randomize the digital key stream.

3,781,474
HYBRID ELECTROSTATIC-IMPACT PRINTER

Philip J. Rice, Jr., Atherton, Calif., assignor to American Express Investment Management Corporation, San Francisco, Calif.

Filed Mar. 6, 1972, Ser. No. 231,957
Int. Cl. H04l *17/00*
U.S. Cl. 178—25 **8 Claims**

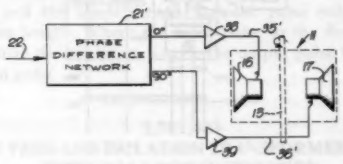
Hybrid electrostatic-impact printer combining a retractable web feeder, on which is mounted an electrostatic printer, and a mechanical impact printer. The hybrid printer allows for rapid receipt and transmission of alpha-numeric information with easy adaptation from the electrostatic mode to the mechanical impact mode by movement of the web feed roller into and out of engagement with the mechanical impact printer.



3,781,475
COUNTERBALANCED TWO SPEAKER ROTARY TREMOLO DEVICE

Paul H. Sharp, Sierra Madre, Calif., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed May 26, 1971, Ser. No. 147,023
Int. Cl. G01h *1/02*
U.S. Cl. 179—1 J **14 Claims**

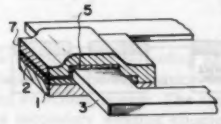


A rotary tremolo device employs a pair of outwardly facing speakers mounted in counterbalanced relationship on a rotatable support. The speakers are respectively driven by signals derived from the same source but differing in phase, preferably by 90 electrical degrees, so as to provide an asymmetrical sound radiation pattern. As the support is rotated at about five to eight revolutions per second, a tremolo and vibrato effect is produced. The support may also be rotated at slower or faster speeds to produce other effects.

3,781,476
MAGNETIC HEAD HAVING A COMBINATION CORE FORMED FROM A PRETREATED MAGNETIC LAYER

Masanobu Hanazono, and Osamu Asai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,383
Claims priority, application Japan, Dec. 25, 1970, 45/117606
Int. Cl. G11b *5/16*
U.S. Cl. 179—100.2 C **12 Claims**



A magnetic head for use in a magnetic disc of a computer, a magnetic drum or a video tape recorder manufactured

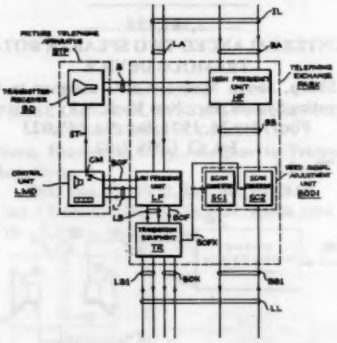
through by a thin film technique. A first portion of the magnetic core thereof is a pretreated rolled permalloy which reduces the magnetic reluctance of the core to almost one-half of that of the conventional cores. This first portion taken with a second portion form a somewhat U-shaped core. Between the open ends is disposed a conductive layer surrounded by one or more dielectric layers. A supporting insulating layer may be provided over the second portion of the core.

3,781,477

PICTURE TELEPHONE SYSTEM AT WHICH THE VIDEO SIGNAL IS ADAPTED TO THE CHARACTER OF THE PICTURE

Nils Olof Johnannesson, Bandhagen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 858,397, Sept. 16, 1969, abandoned. This application May 17, 1971, Ser. No. 144,162
Claims priority, application Sweden, Oct. 8, 1968, 13536/68
Int. Cl. H04m *11/00*
U.S. Cl. 179—2 TV **3 Claims**



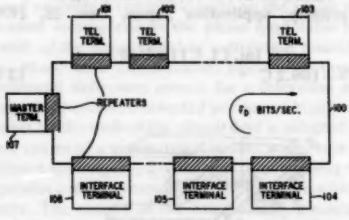
In a picture telephone system means are included at both ends of a telephone connection between two subscribers for adjusting the frame rate of pictures so that with a limited channel band width good resolution is obtained both for stationary detailed pictures such as documents and for moving pictures requiring less resolution such as conversing subscribers.

3,781,478

MULTIPLEX COMMUNICATION SYSTEM

Donald Edgar Blahut, Bloomfield, and Fritz Edgar Froehlich, New Shrewsbury, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 7, 1972, Ser. No. 269,824
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **20 Claims**



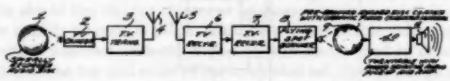
A time division multiplex communication system is described which includes a master timing station and a plurality of station sets serially interconnected forming a closed unidirectional transmission loop. Data and supervisory signals originating at a station set, together with digitally encoded speech, are time division multiplexed onto the loop, the information being inserted *m* bits at a time in a particular TDM channel associated with the called set. Each station set is arranged to store and repeat *m* bits at a time, the received digital bit stream, which may comprise data or supervisory signals while at the same time monitoring its assigned channel for the presence of information being transmitted thereto. A called set is arranged to extract and decode information contained in its channel, also *m* bits at a time. Since, for *n* station sets, the $n \times m$ bits on the loop at any given time can be stored within the stations, the number *n* of stations can be changed without alteration of any other equipment on the loop. Supervisory logic within each station set controls various set functions, including busy tone generation, ringer control, ringback indication, and so forth. One or more station sets may be modified to provide an interface with outside lines.

3,781,479

METHOD AND APPARATUS FOR TRANSMITTING TIME COMPRESSED AUDIO INFORMATION

Maxmillian Augustus Swoboda, College Park, Md., assignor to Jack L. Lahr, Washington, D.C. and Jack M. Benson, Silver Spring, Md.

Filed Jan. 26, 1970, Ser. No. 5,659
Int. Cl. H04m *1/00*
U.S. Cl. 179—15.55 T **10 Claims**



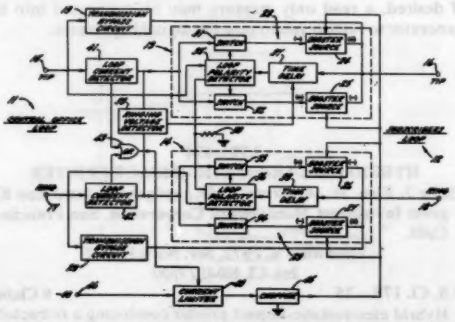
This specification discloses a method of storing, transmitting and selectively retrieving a large quantity of information such as audio signals over a wide bandwidth communication system such as television. An entire block of such information is recorded at a real-time rate, rapidly transmitted in its entirety at a greatly accelerated rate by a relatively wide bandwith signal, received and re-recorded at substantially the same accelerated rate for subsequent reproduction of the audio information at a real-time rate. Several specific methods and apparatus are disclosed for carrying out these concepts.

3,781,480

LOOP EXTENDER

Ralph R. Roge, Du Page County, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Nov. 10, 1970, Ser. No. 88,270
Int. Cl. H04q *1/30*
U.S. Cl. 179—16 F **10 Claims**



To increase the effective signaling and supervisory range of a central office, a loop extender has tip side and ring side

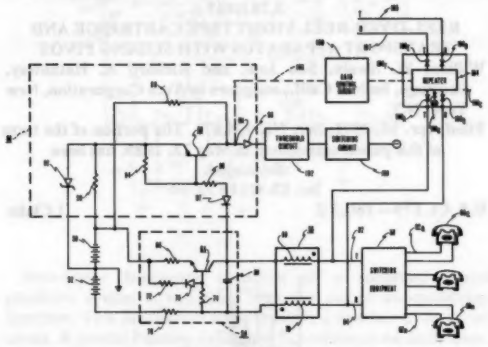
booster circuits, each of which comprise a pair of oppositely polarized floating booster voltage supplies and a loop polarity detector for selectively switching one of such supplies into series with the central office battery. Time constant circuits are associated with each of the loop polarity detectors so that they follow changes in the d. c. polarization of the central office ring and tip leads relative to one another and to ground, but not the a.c. swings of any ringing voltage that may be present. Provision is made, however, for overriding the time constant circuit for the tip side polarity detector in the absence of a ringing voltage so that it can then follow short time constant changes in the d. c. polarization of the tip lead. The booster voltage supplies are secondary supplies which are energized by power from a primary supply only in the presence of a control signal in one or both of the central office tip and ring leads, whereby the power drained by the loop extender is minimized. Further, the maximum current that can be drawn from the primary supply is limited, thereby protecting the loop extender and other central office equipment against being damaged in the event that the output of the loop extender is inadvertently short circuited or coupled to a low impedance subscriber's loop.

3,781,481

AMPLIFIER SELECT AND CONTROL CIRCUIT

William E. Shaffer, and Charles C. Krawczyk, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Sept. 30, 1971, Ser. No. 185,228
Int. Cl. H04b *3/36*
U.S. Cl. 179—16 F **12 Claims**



The disclosed amplifier select and control circuit provides a means for connecting an amplifier in a telephone connection as required to compensate for the loss of voice signals because of attenuation in the system. The amplifier select and control circuit comprises a current limiting circuit for the direct current flow in the telephone connection and a detector circuit to provide a signal that is a function of the resistance of the connected telephone line. When the resistance is above a preset level, an amplifier or repeater is connected into the connection. An additional feature is the provision of an automatic gain arrangement to vary the gain of the amplifier or repeater as a function of the resistance of the line.

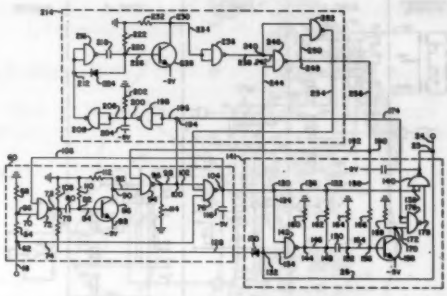
3,781,482

PULSE-CORRECTING SYSTEM FOR A TELEPHONE SIGNALING SYSTEM

Otto G. Wisotzky, San Francisco; Tom L. Blackburn, San Jose, and Roy J. G. Urbach, Redwood City, all of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 31, 1972, Ser. No. 222,183
Int. Cl. H04q *1/36*
U.S. Cl. 179—16 EA **12 Claims**

Pulse correcting circuitry, including three timing means, which provide minimum "break" and "make" pulse intervals at a receiving terminal. A first timer delays and subtracts a first predetermined time duration from the input pulse and delays the appearance of the pulse at the output of the first timer by this first predetermined time duration. A second timer is operatively connected with the first timer and prevents activation of the first timer for a second predetermined time interval in order to prevent operation of the pulse correcting circuitry on spurious pulses. Following the second



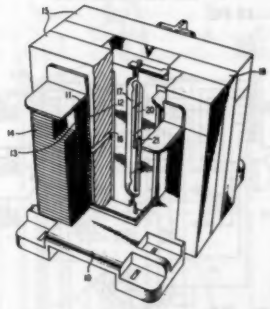
predetermined time interval, the state of the outputs of the second timer are set and they are held for a third predetermined time interval. When the first and second timers permit an output to occur from the first timer, a third timer is activated and this timer insures that the pulse output has a minimum length. Where the input pulse to the first timer is longer than the minimum length, the output pulse is equal to the input pulse.

3,781,483

LINE FEED AND ISOLATION TRANSFORMER WITH INTEGRAL LOOP SUPERVISION

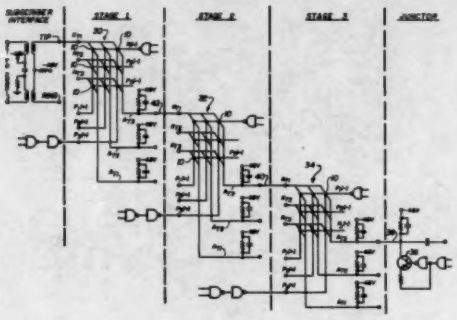
Cecil Winston Deisch, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 2, 1971, Ser. No. 204,001
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 F **4 Claims**



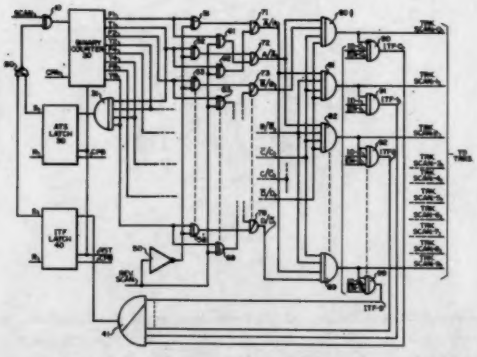
Apparatus is disclosed for providing all of the functions of battery-feed, isolation, and supervision for a line circuit in a communication switching system. The apparatus comprises a primary and a secondary winding coupled inductively via a magnetic core which includes an air gap. A reed contact pair is positioned across the air gap to operate and give indication of the presence of magnetic flux across the air gap resulting from current flow in the primary winding.

3,781,484
PATH SELECTION TECHNIQUE FOR ELECTRONIC SWITCHING NETWORK
Max S. Macrander, Warrenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 23, 1971, Ser. No. 211,500
Int. Cl. H04q 3/50
U.S. Cl. 179—18 GF 9 Claims



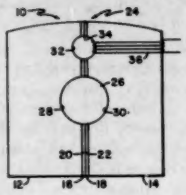
A switching circuit using crosspoint switching elements including a four terminal pnpn semiconductor device such as a thyristor, a cathode terminal for connection to an information signal line, an anode terminal for connection to another signal line and P(−) and P(+) terminals for receiving control signals to interconnect the information signal lines through the crosspoint switching element, and means for biasing the cathode terminal negative with respect to ground and for biasing the anode terminal at ground potential, thereby eliminating extra voltage sources required in such prior art crosspoint switching elements and decreasing the amount of the normally required gate current.

3,781,485
TRUNK SELECTION SCANNING CIRCUIT
John W. Woodward, Schaumburg, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Aug. 9, 1972, Ser. No. 279,113
Int. Cl. H04m 3/22
U.S. Cl. 179—18 FG 9 Claims



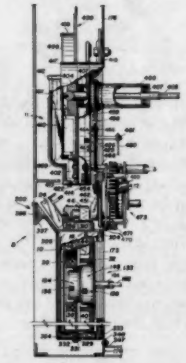
A scanning circuit for selecting outgoing or two way trunk circuits in a crosspoint switching system, where two attempts are made to select an idle trunk. The first scan is made in one direction, with the second scan made in the reverse direction.

3,781,486
MAGNETIC HEAD TRANSDUCER
Michael B. Maryatt, Cupertino, and James M. McCoy, San Jose, both of Calif., assignors to Avco Corporation
Filed Apr. 26, 1972, Ser. No. 247,690
Int. Cl. G11b 5/22, 5/42
U.S. Cl. 179—100.2 C 6 Claims



A thin layer of nonmagnetic material, such as silicon dioxide, is chemically vapor deposited on confronting gap faces of a pair of ferromagnetic pole pieces. The pole pieces are bonded together in abutting relationship so that the nonmagnetic material defines a transducing gap between the pole pieces. Preferably the pole pieces are formed in relatively thick blocks that are bonded together after the nonmagnetic material is deposited and then sliced to form a plurality of individual transducers.

3,781,487
REEL-OVER-REEL VIDEO TAPE CARTRIDGE AND TRANSPORT APPARATUS WITH SLIDING PIVOT
William W. Swain, San Jose, and Richard A. Hathaway, Saratoga, both of Calif., assignors to Avco Corporation, New York, N.Y.
Filed Apr. 16, 1971, Ser. No. 134,677. The portion of the term of this patent subsequent to May 23, 1989, has been disclaimed.
Int. Cl. G11b 23/04
U.S. Cl. 179—100.2 Z 1 Claim



The invention herein disclosed comprises an improved video tape cartridge, in combination with handling apparatus included in a tape transport of the type having rotatably mounted multiple transducers. The cartridge is of the reel-over-reel type and it is placed into the ejector element of novel handling apparatus comprising an ejector and a carriage. As the cartridge is placed in the ejector, being located by a slot and spline arrangement, a brake within the cartridge housing is released. The carriage is swingably mounted so that it is swung from an inclined position into a vertical position and

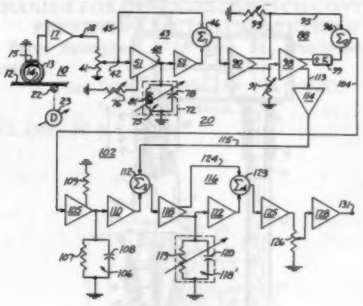
then displaced forwardly in order to locate a poised span of tape relative to the multiple tranducers. During the movement of the carriage, a lid is opened in order to expose the said span of tape. Additionally, during such movement, clutch formations formed on the reels grasp respective spindles rotatably mounted on the tape transport. As the cartridge is moved into position locator pins on the tape transport register with aligned openings on the face of the cartridge. The cartridge is formed with integral compartments for the reception of tape pick-up elements and a pressure roller.

3,781,488

PLAYBACK SYSTEM WITH FREQUENCY EQUALIZATION BY CASCADED CIRCUITS PERFORMING IN ACCORDANCE WITH PARTIAL FRACTION EXPANSIONS OF FACTORIAL EQUALIZING FUNCTION TERMS

Robert A. Byers, Altadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 22, 1971, Ser. No. 155,564
Int. Cl. G11b *5/44*
U.S. Cl. 179—100.2 K **19 Claims**



Non-linear frequency response of a recorded signal playback system is equalized with the aid of an equalizing function. This function is analyzed into a number of factorial terms. A partial fraction expansion is performed on each term. A number of cascaded electric circuits is provided for performing the equalizing function on played-back electric signals. The cascaded circuits include for each factorial term an electric circuit for performing in accordance with the particular partial fraction expansion a function conforming to the particular term. The played-back electric signals are subjected to the cascaded circuits to equalize the non-linear frequency response of the playback system.

The playback system may be a multi-speed playback system, in which case one of the function-performing circuits is adjusted for each speed of the playback system to adapt the equalization to the particular speed.

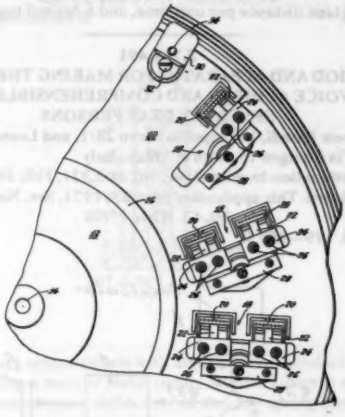
3,781,489

METHOD AND APPARATUS FOR ALIGNING MAGNETIC HEADS IN A MAGNETIC DISC RECORDER

Abraham Brand, Encino, Calif., assignor to General Instrument Corporation, Hawthorne, Calif.

Filed Aug. 2, 1972, Ser. No. 277,327
Int. Cl. G11b *5/56*
U.S. Cl. 179—100.2 R **17 Claims**

A method and apparatus for accurately aligning a plurality of magnetic heads in a magnetic disc recorder and reproducer, including the use of a transparent disc member having radial lines arranged around a central opening of the disc member, and having lines perpendicular to the radial lines also arranged around the central opening, and with the combination of the radial lines and the lines perpendicular to the radial lines forming locations for the alignment of the magnetic heads, and with the magnetic heads divided into groups supported in comb members accurately located to properly position the magnetic heads in a group relative to each other and to provide the air gaps of such group of magnetic heads to be along a straight line and with each comb member supported by a mounting means and with the transparent disc member including openings located adjacent to the radial lines to provide access to the mounting means to provide for the proper alignment of the groups of magnetic heads.

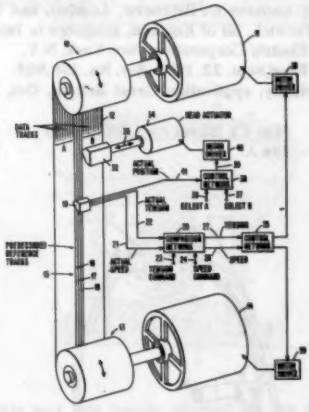


3,781,490

WEB TENSION AND SPEED CONTROL IN A REEL-TO-REEL WEB TRANSPORT

William B. Phillips, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 198,925, Nov. 15, 1971, abandoned. This application June 1, 1973, Ser. No. 365,891
Int. Cl. G11b *19/28*
U.S. Cl. 179—100.2 S **7 Claims**



A reel-to-reel magnetic tape transport for a relatively wide tape which carries a number of laterally spaced data track groups and prerecorded reference tracks. Control transducer means senses the reference tracks and provides an output signal indicative of increments of tape movement. This information is used to derive an output signal indicative of the tape speed, i.e., displacement per unit time. The control transducer

means also provides a signal indicative of the lateral position of the tape. The control transducer means includes a tension transducer which provides an output signal indicative of the tape tension. The lateral tape position signal controls the lateral position of a data processing head. The tape speed signal and tape tension signal jointly control the two reel drive motors to maintain a desired tape speed, i.e., a desired incremental tape distance per unit time, and a desired tape tension.

3,781,491

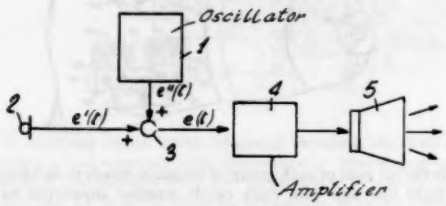
METHOD AND APPARATUS FOR MAKING THE HUMAN VOICE AUDIBLE AND COMPREHENSIBLE TO SEVERELY DEAF PERSONS

Emanuele Biondi, Via Ippolito Nievo 28/1, and Leonardo Biondi, Via Rontgen 19, both of Milan, Italy

Continuation-in-part of Ser. No. 803,321, Feb. 28, 1969, abandoned. This application June 23, 1971, Ser. No. 156,109

Int. Cl. H04r *25/00*

U.S. Cl. 179—107 R **5 Claims**



A method and apparatus is provided for making the human voice audible and comprehensible to severely deaf persons which includes transforming an acoustic information signal corresponding to the human voice to corresponding electric signals, and summing these electric signals with a generated periodic signal or pseudo-carrier to provide a summation signal which is amplified and transformed to an acoustic signal. The method is based on the theory that the summation signal can pass through a diseased synapsis more easily than the separate information signal or the pseudo-carrier signal.

3,781,492

HEADSET

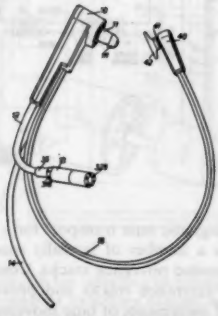
William D. Cragg, Harlow; Leslie E. B. Dymoke-Bradshaw, Edgeware; Anthony C. Batchelor, London, and Ronald D. Carter, Warwick, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 22, 1972, Ser. No. 290,905

Claims priority, application Great Britain, Oct. 21, 1971, 48,953/71

Int. Cl. H04m *1/05*; **H04r** *1/28*

U.S. Cl. 179—156 A **20 Claims**



A headset includes a main housing containing a miniature demountable earphone, a microphone pre-amp and a snap-on earpiece. The housing is connected to one end of an adjustable boom having a pressure gradient microphone at the other end. The microphone has a piezoelectric disc transducer mounted midway from either end of a cylindrical housing and perpendicular thereto, the cylinder halves being separate acoustic resonators of predetermined frequency to provide an upper limit of operation.

3,781,493

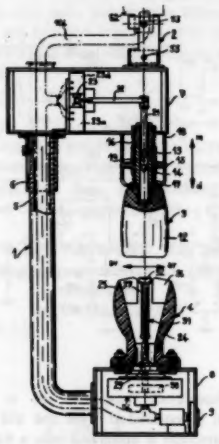
GROUND LEVEL CONTROL SYSTEM FOR LIFTING APPARATUS WITH UNIVERSAL TYPE CONTROLLER FOR SWITCH ASSEMBLIES

Michel Darmon, Paris, France, assignor to I.N.R.S., Paris, France

Filed Apr. 21, 1972, Ser. No. 246,438

Int. Cl. H01h *3/00*

U.S. Cl. 200—6 A **10 Claims**



A system for controlling from ground level a lifting apparatus which is adapted to move a load in a vertical direction and two horizontal directions comprises an operating support suspended from the lifting apparatus by an antigyratory suspension on which are mounted manipulators controlling switch means causing movement of a load carried by the lifting apparatus, the manipulators being moved to operate switch means in directions parallel to the directions of displacement of the load to be caused thereby and in the same sense of direction.

3,781,494

CAM OPERATED IGNITION POINT ASSEMBLY

Paul Tremarco, Hewitt, N.J., assignor to Edson Enterprises, Inc., Hewitt, N.J.

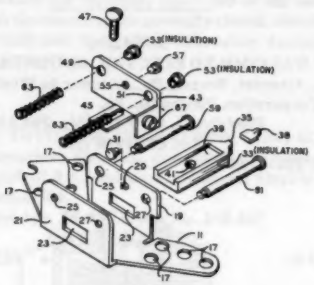
Filed Jan. 9, 1973, Ser. No. 322,113

Int. Cl. H01h *19/62*

U.S. Cl. 200—30 A **11 Claims**

An improved set of ignition points for use in automobile engines and the like in which the points are opened and closed

by a plunger wherein the moving point is maintained parallel to the fixed point by a pair of guide pins. The points are



mounted on a base member which contains a plurality of holes to permit the points to be used as a direct replacement.

3,781,495

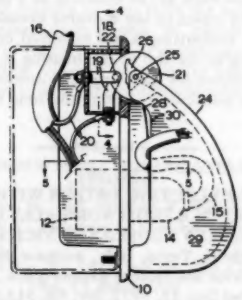
SAFETY SWITCH WITH HINGE TYPE INTERLOCKING MECHANISM FOR OPERATING SWITCH CONTACTS OR PREVENTING ACTUATION THEREOF

John Peter Splingaerd, 715 Pine St., Dunnville, Ontario, Canada

Filed Sept. 29, 1972, Ser. No. 293,433

Int. Cl. H01h *9/22*

U.S. Cl. 200—50 A **9 Claims**



In association with an electrical outlet there is provided a cover member which is pivotally mounted to the outlet mounting plate for movement between a first position in which the cover member covers the electrical outlet and a second position in which this outlet is uncovered. An electric switch is connected in circuit with the electrical outlet whereby when the switch is in an open condition the electrical outlet is deenergized, and when the switch is in a closed condition the electrical outlet is energized, the switch incorporating a disc of electrically insulating material which is mounted on the cover member coaxially with the pivotal mounting thereof and through which a body of electrically conducting material is eccentrically mounted. The disc thus turns in the appropriate direction during pivotal movement of the cover member between the first and second positions thereof, the body of electrically conducting material being disposed between and in contact with spaced electrical contacts of the switch when the cover member is in the first position so that the switch is thus in the closed condition, and a portion of the disc of electrically insulating material being disposed between the contacts of the switch when the cover member is in the second position so that the switch is thus in the open condition.

3,781,496

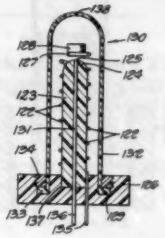
TIMING SENSOR SWITCH WITH OSCILLATING COIL SPRING AND METAL MASS CONTACT

John Leslie Jones, Sr., 1070 Glen Oaks Rd., Pasadena, Calif.

Division of Ser. No. 063,750, Aug. 14, 1970, Pat. No. 3,690,695. This application Sept. 5, 1972, Ser. No. 286,463

Int. Cl. 200 *61.51*; **H01h** *35/14*

U.S. Cl. 200—61.45 R **1 Claim**



An impact sensor switch with an oscillating conductive coil spring having a mass of metal rigidly attached thereto engages a fixed contact upon deflection of the coil spring and metal mass.

3,781,497

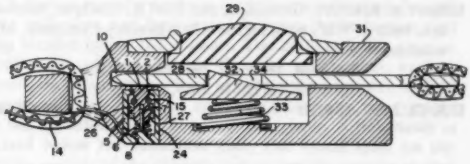
SEAT BELT BUCKLE PLUNGER TYPE SWITCH AND HOUSING CONTAINING BELT LATCH MECHANISM

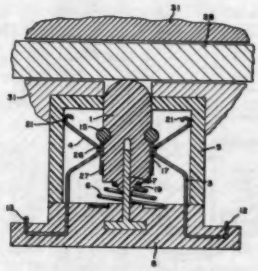
Robert L. Stephenson, Sterling Heights, and Yogendra S. Loomba, Roseville, both of Mich., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Oct. 12, 1972, Ser. No. 297,137

Int. Cl. H01h *13/62*

U.S. Cl. 200—61.58 B **19 Claims**





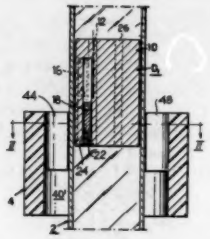
A vehicle seat belt buckle adapted for use in a warning system comprising in combination a buckle with slot for receiving a tongue in locking engagement, which tongue upon insertion into the buckle depresses a plunger switch either from a closed circuit position to an open circuit position or from an open circuit position to a closed circuit position, as desired. The plane surface of the tongue maintains the plunger switch in the depressed position until said tongue is unlatched and withdrawn from the buckle.

3,781,498

LIQUID LEVEL DETECTOR

Zvi Kamil, Tel Aviv; Yoel Amir, Omer, and Omri Talmon, Beer-Sheva, all of Israel, assignors to Beta Engineering & Development Ltd., Beer-Sheva, Israel

Filed June 26, 1972, Ser. No. 266,447
Int. Cl. H01h 35/18
U.S. Cl. 200—84 C 7 Claims



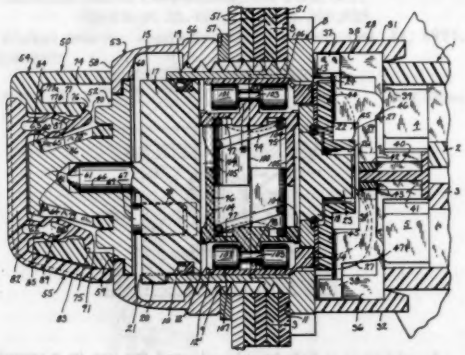
A liquid-level detector comprises a sensing device including a magnetically-actuated switch and a fixed magnet whose magnetic field causes the switch to normally assume one operating condition. The sensing device further includes a movable magnet movable from a first position where it exerts no significant influence on the magnetic field of the fixed magnet to a second position wherein it influences the magnetic field of the fixed magnet to cause the switch to assume its other operating condition. The detector further includes a float carrying a float magnet adapted to move the movable magnet to actuate the switch.

3,781,499

SELECTOR SWITCH WITH PARTICULAR OPERATOR MEANS, AND DETENTS WHICH ARE RESTRAINED FROM ROTATION

Gilbert A. Reichert, Greendale, and Earl R. Moehrle, Milwaukee, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 18, 1972, Ser. No. 286,531
Int. Cl. H01h 3/08, 3/50
U.S. Cl. 200—166 SD 11 Claims



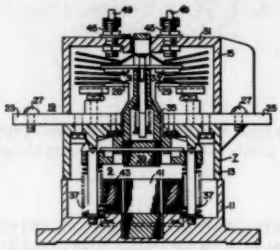
A selector switch actuator includes an actuator sleeve having a cam surface formed around its interior surface. A rotor is journaled within the actuator sleeve and includes a bias spring located within a transverse opening formed through the rotor. A roller is rotatably attached to each end of the spring by a spring seat and the rollers are forced radially outward with equal, but opposite force against the cam surface to force the rotor into one of a plurality of selectable positions. An easily assembled knob structure is shown which includes a threaded cover that attaches to the actuator sleeve to fasten the switch to a mounting wall.

3,781,500

GAS COOLED ELECTRICAL CONTACTOR

Kurt A. Grunert, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1972, Ser. No. 294,135
Int. Cl. H01h 1/62
U.S. Cl. 200—166 K 10 Claims



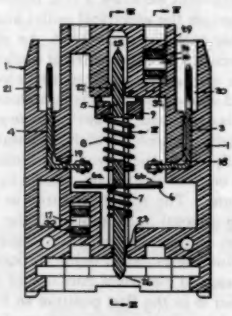
A contactor characterized by an electrically insulating housing containing a plurality of sets of contacts including corresponding pairs of stationary contacts and movable contacts movable between open and closed positions with respect to each other; the housing having a top wall extending over the movable contacts, gas coolant means for directing currents of coolant gas onto each set of contacts in a direction aligned with the path of travel of the movable contacts, and the gas coolant means comprising a gas manifold connected to gas conduits leading to the top of the housing in which gas inlet nozzles are provided for directing the currents of gas to each set of contacts, particularly during the time the switches are closed.

3,781,501

SINGLE POLE ELECTRIC SWITCH WITH CONTACTS CONVERTIBLE FROM NORMALLY OPEN TO NORMALLY CLOSED AND VICE VERSA

Giuseppe Borghetti, Turin, Italy, assignor to Telemeccanica Elettrica Officine Meccaniche Riunite S.p.A., Milan, Italy

Filed Dec. 11, 1972, Ser. No. 313,844
Claims priority, application Italy, Dec. 22, 1971, 32766 A/71
Int. Cl. H01h 1/34
U.S. Cl. 200—166 BC 8 Claims



An electric switch having fixed contacts on a housing and having an invertible bar slidable therein, the bar carrying a

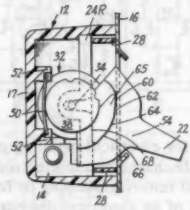
contact bridging arm with contacts engageable with the fixed contacts, a contact pressure applying spring acting between the bar and the arm and a return spring acting between the bar and an abutting element mounted off-center on an invertible and removable lid for the housing. In one position of the bar and lid, the contacts are normally open and in the inverted position thereof, the contacts are normally closed, the contact position being indicated by symbols alternately exposed depending on the lid position.

3,781,502

MERCURY SWITCH WITH HEAT SINK CONTACT

Walter C. Schumacher, Warwick, and Ralph L. Graves, East Greenwich, both of R.I., assignors to General Electric Company, Providence, R.I.

Filed Apr. 28, 1972, Ser. No. 248,407
Int. Cl. H01h *29/20*
U.S. Cl. 200—226 **16 Claims**



A mercury switch is provided which gives a mercury button a higher switching capacity in terms of the level of electric power which can be switched. The switch is provided with novel contacts which have spring action to enhance both electrical contact and transfer of heat from the button and from the switch. Greater compactness of switch structure is achieved in spite of the higher power switching capability built into the switch thus reducing crowding of wire connections within the wall box in which the switch is mounted.

3,781,503

SOLID STATE INDUCTION COOKING APPLIANCES AND CIRCUITS

John D. Harnden, Jr., and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 19, 1971, Ser. No. 200,424
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **23 Claims**

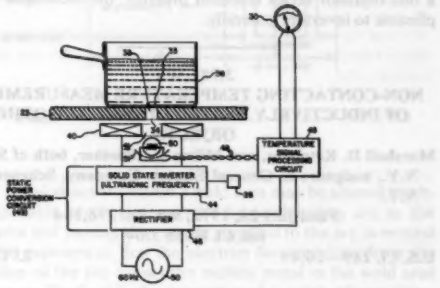
An economical smooth-top cooking appliance for inductively heating cooking utensils preferably comprises a flat air-core induction heating coil driven at an ultrasonic frequency by a simplified one-thyristor, one-transistor, or two-transistor resonant inverter. The series and parallel resonant circuits in the inverters are formed by a capacitor and the induction heating coil. The one-thyristor series resonant circuit is desirable because power control to adjust the cooking temperature is obtained by the combined effect of increasing the frequency and amplitude of the sinusoidal current pulses supplied to the coil. The coil is also movable to change the gap spacing between coil and utensil to vary the coupled power. Flux beneath the coil is used for warming purposes.

3,781,504

INDUCTION COOKING APPLIANCE INCLUDING TEMPERATURE SENSING OF INDUCTIVELY HEATED COOKING VESSEL BY RADIATION DETECTION MEANS

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,351
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **8 Claims**



Herein disclosed is an induction range having a counter on which there is rested a cooking vessel to be inductively heated by an induction coil having an air core; the induction coil being located below the counter. The counter has a passage therethrough extending from the top, or working, surface thereof, on which the cooking vessel rests, to a lower surface thereof near the induction coil. The passage in the counter and the induction coil's core are in register. A bolometer is situated below the induction coil. The vessel rests on the working surface of the counter and covers the passage so that the bottom of the vessel is in an unobstructed line with the bolometer. The bolometer receives radiant heat energy from the inductively heated vessel and is instrumental in determining the temperature thereof.

3,781,505

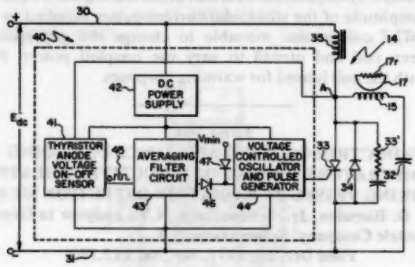
CONSTANT DUTY CYCLE CONTROL OF INDUCTION COOKING INVERTER

Robert L. Steigerwald, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 28, 1972, Ser. No. 267,143
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **12 Claims**

In a solid state cool-top cooking appliance for inductively heating a utensil, an inverter for driving the induction heating coil utilizes a constant duty cycle control circuit to optimize performance with the utensil coupled with and removed from the energized coil. To compensate for the increased period of oscillation when unloaded, the inverter operating frequency is automatically decreased to reduce voltage and current stresses on circuit components. Conversely, the operating frequency increases when loaded to couple more power to the utensil. An on-off sensor continuously senses an inverter circuit parameter indicative of the load condition, such as a volt-

age divider and associated switch for sensing the thyristor anode voltage. The sensed information is processed by the control circuit in closed feedback loop manner to vary the


DC POWER SUPPLY
THYRISTOR ANODE VOLTAGE ON-OFF SENSOR
AVERAGING FILTER CIRCUIT
VOLTAGE CONTROLLED OSCILLATOR AND PULSE GENERATOR

thyristor gating signal repetition rate. Disclosed with regard to a one-thyristor series resonant inverter, the technique is applicable to inverters generally.

3,781,506

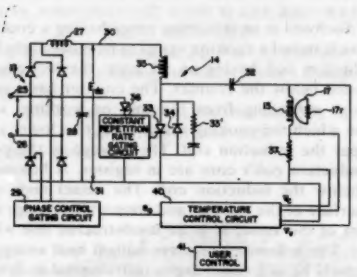
NON-CONTACTING TEMPERATURE MEASUREMENT OF INDUCTIVELY HEATED UTENSIL AND OTHER OBJECTS

Marshall D. Ketchum, and Milton D. Bloomer, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 28, 1972, Ser. No. 276,164

Int. Cl. H05b *5/04*

U.S. Cl. 219—10.49 **23 Claims**



A solid state cool-top induction cooking appliance equipped to set and maintain a selected utensil temperature. A non-contacting temperature sensing technique is based on sensing an inverter power circuit parameter that varies with the utensil temperature, and thus does not require holes in the cooking surface or sensors that project above. The power circuit parameter is typically an interval of oscillation or a damping factor, such as the interval between zero-crossing points of the instantaneous induction heating coil current. The temperature signal derived therefrom is corrected for other circuit factors, for example, a variable input voltage, that also cause a change in the selected power circuit parameter. A user control setting signal can also be summed with the temperature signal. The corrected temperature signal is employed in closed feedback loop fashion to adjust the power coupled to the utensil to maintain the set temperature. The method of measuring and controlling temperature is applicable to inductively heated objects other than cooking utensils, and induction heating apparatus incorporating the temperature control circuitry is useful in a variety of applications.

3,781,507

SERVOSYSTEM FOR ELECTRICAL MACHINING PROCESSES

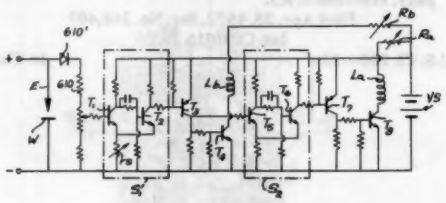
Kiyoshi Inoue, 3-chome 16-8, Kamiyoga, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 19,364, March 13, 1970, Pat. No. 3,686,461. This application July 17, 1972, Ser. No. 272,463

Claims priority, application Japan, Mar. 13, 1969, 44/18991; Apr. 2, 1969, 44/25317; Apr. 2, 1969, 44/25318; Apr. 30, 1969, 44/33960; May 30, 1969, 44/42188; Nov. 1, 1969, 44/87832; Nov. 26, 1969, 44/94741; Nov. 26, 1969, 44/94742

Int. Cl. B23p *1/14*

U.S. Cl. 219—69 G **9 Claims**



A servosystem for electrical maching processes adapted to regulate a spark-discharge gap in electrodischarge machining and other material-removal, shaping or forming operations in which the energy of an electrical discharge across the gap is exploited. Instead of the usual reference voltage or other electrical value for comparison with a gap parameter whereby the difference or other algebraic comparison controls the electrode drive, a gap detector is provided to feed a substantially continuous (anlog) value to a discriminator having a threshold value and producing a digital output in accordance with the comparison. The digital output represents an "advance" or a "retract" condition and is communicated via a suitable switch or amplifier to the respective electromagnetic member of the control system, the latter member being a servomotor mechanically coupled with the movable electrode or a fluid-control valve hydraulically or pneumatically coupled with the movable electrode.

3,781,508

APPARATUS FOR PLASMA WELDING

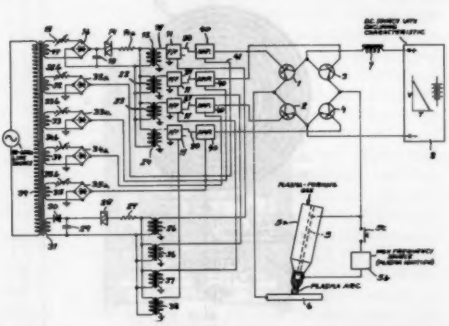
Horst Dauer, Pfaffenhofen, and Peter Hildebrandt, Ismaning, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Sept. 13, 1971, Ser. No. 179,896

Claims priority, application Germany, Sept. 18, 1970, P 20 46 227.5

Int. Cl. B23k *9/00*

U.S. Cl. 219—121 P **8 Claims**



Plasma welding of light-metal workpieces and materials subject to oxidation is carried out using square-wave alternat-

ing current. The energization circuit comprises a bridge of controllable rectifier-type elements, the welding electrode network being positioned in a diagonal of the bridge while a direct-current source with a declining characteristic is connected across the other diagonal.

3,781,509

METHOD AND DEVICE FOR WELDING ALIGNED SHEET METAL PLATES TOGETHER FOR FORMING A BAND FOR MAKING SPIRAL SEAM TUBES

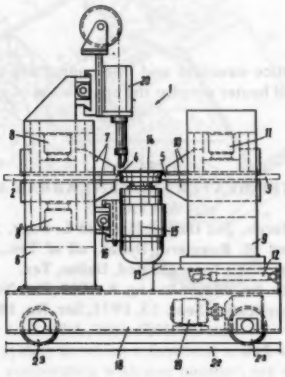
Heinz Krakow, Hamburg, Germany, assignor to Blohm & Voss AG., Hamburg-Steinwerder, Germany

Filed May 13, 1971, Ser. No. 143,035

Claims priority, application Germany, June 4, 1970, P 20 27 439.9

Int. Cl. B23k 9/12

U.S. Cl. 219—125 R **7 Claims**



A continuous band for use in making spiral seam tubes is made by horizontally aligning sheet metal plates in a common horizontal plane and clamping each adjacent end of the plates separately. A milling cutter is introduced in a slot formed between the adjacent transverse edges of these plates to trim and chamfer these two transverse edges simultaneously. Thereupon at least one of the clamping devices for clamping one of the plates is moved toward the other clamping device holding the other plate so that a welding joint is formed between the two transverse edges, which are then welded together.

3,781,510

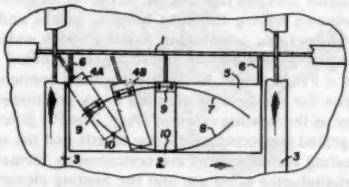
APPARATUS FOR WELDING INTERRUPTED SEAMS

Ulrich Ploetz, Rostock-Warnemunde, and Wolfgang Thiesen, Rostock, both of Germany, assignors to VEB Ingenieurburo Schiffbau, Rostock-Osthafen, Germany

Filed July 9, 1971, Ser. No. 161,004

Int. Cl. B23k 9/00

U.S. Cl. 219—130 **4 Claims**



Welding apparatus is traversed along a weld gap to be welded, from one interruption of the required weld seam to another such interruption. Incident thereto, the apparatus is manipulated so that near the first interruption the weld arc is in trailing position but near the second interruption it is in leading position relative to the welding apparatus.

3,781,511

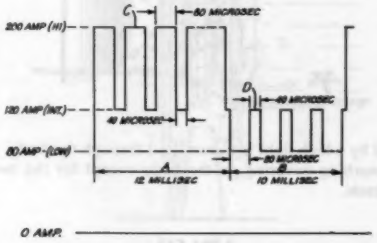
METHOD OF WELDING EMPLOYING SQUARE WAVE CURRENT PULSES AND CAUSING THE MOLTEN METAL TO RESONATE

Henry V. Rygiol, 3146 Perrer Rd., Escondido, Calif.

Filed Mar. 23, 1972, Ser. No. 237,452

Int. Cl. B23k 9/10

U.S. Cl. 219—137 **5 Claims**



The metal structure within a weld area may be altered to obtain desirable physical properties by applying an arc to the weld area and pulsing the current supplied to the arc in several different manners so that the electron flow resulting from the operation of the arc causes the molten metal in the weld area to resonate. Preferably the current used consists of repetitive, sequential current "units" of two different series of sequential welding pulses, the first of such "units" consisting of a series of pulses of a square wave form varying between first and second current levels and the second of such "units" consisting of a series of current pulses of substantially a square wave form varying between either the second or a third level and a fourth current level. Various metals and alloys which are difficult and/or substantially impossible to weld by established techniques can be welded utilizing a weld current consisting of such "units."

3,781,512

METHOD OF UNDERWATER WELDING USING VIEWING SCOPE

Conway E. Grubbs, Glen Ellyn, Ill., and Dale R. Anderson, Zachary, La., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

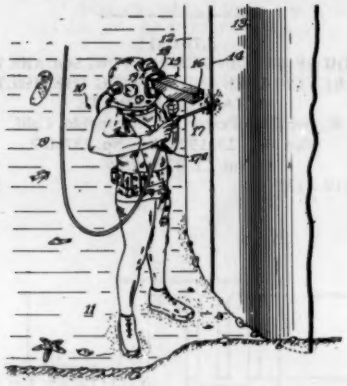
Filed June 6, 1972, Ser. No. 260,243

Int. Cl. B23k 9/00

U.S. Cl. 219—137 **20 Claims**

A method of underwater wet welding in water in which a transparent light-permeable viewing scope having a viewing end and an objective end is positioned in the water between the eyes of an underwater welder and a metal object to be welded, the viewing end of the viewing scope being positioned close to the eyes of the underwater welder, the objective end of the viewing scope being positioned spaced away from the object sufficiently far to provide clearance for a welding electrode therebetween, and a weld is deposited on the metal object by means of the electrode while the object and weld are in contact with the water and they are observed through the viewing scope by the welder. The method can be used to weld in turbid water in which the distance of human visability, when illuminated by daylight or artificial light, is less than needed by an underwater welder to directly view and weld an object without the viewing scope.

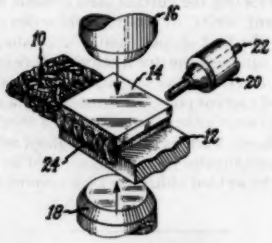
An underwater viewing scope, for viewing in water, having a transparent body with a viewing end and an opposing objective end by which light is transmitted through the body, and a light-absorbing covering on the body except for the two opposing ends.



3,781,513
FUSION BRAID WELD

Moreland P. Bennett, Hickory, N.C., assignor to General Electric Company

Filed Jan. 2, 1973, Ser. No. 320,114
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 5 Claims



Means for joining braided copper leads or terminals to aluminum bus bars or tap straps. The means provides for clamping the braided copper member to the aluminum, preferably by means of a copper heat sink. Then the edges or overlapped areas of the copper and aluminum are fusion welded by a gas metal arc welding process with automatic aluminum wire feed. In a modified version a copper alloy wire is hand fed to the joint together with the aluminum filler wire from the welding gun.

3,781,514
ELECTRICALLY HEATED GLOVE WITH A FLEXIBLE LATTICE HEATING STRUCTURE

Mark W. Olson, Allendale, and Walter F. Silva, Riverdale, both of N.J., assignors to Uniroyal, Inc., New York, N.Y.

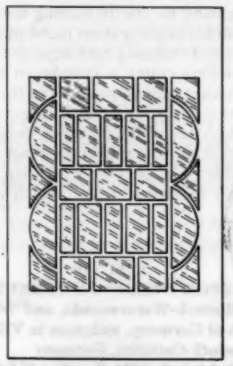
Division of Ser. No. 117,723, Feb. 22, 1971, which is a division of Ser. No. 827,209, May 23, 1969, Pat. No. 3,635,623. This application Nov. 7, 1972, Ser. No. 304,351
Int. Cl. H05b *3/36*
U.S. Cl. 219—211 1 Claim

An electrically heated glove having a flexible lattice structure of plastic material having an electrical heater wire embedded therein and extending continuously in adjacent lengths along the length of said lattice structure. The electrical heater wire having a plurality of heater wire loops extending from said lattice structure and interconnecting said adjacent lengths of said heater wire for the application of electrical current thereto.

3,781,515
INTEGRATED HEATER ELEMENT ARRAY AND DRIVE MATRIX

Marvin L. Morris, Jr., Dallas; Hermon L. Pope, Jr., Houston, and Edward M. Ruggiero, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 848,564, Aug. 8, 1969, Pat. No. 3,631,459. This application Sept. 13, 1971, Ser. No. 180,054
Int. Cl. H05b *1/00, 3/00*
U.S. Cl. 219—216 11 Claims



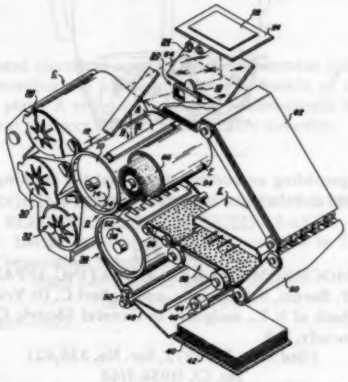
Thermal display including an air isolated integrated semiconductor circuit forming an array of semiconductor heater elements having different heights, widths and shapes joined by a metallic connecting pattern which extends out over the heating elements to interconnect selected ones of them and a PN junction isolated integrated semiconductor drive matrix for the heating element array positioned in the same plane as the heating element array. The PN junction isolated integrated semiconductor drive matrix and the semiconductor heating element array are concurrently formed in the same semiconductor substrate and the heating element array is air isolated to provide a high degree of electrical and thermal isolation for the heating element array while both are located in the same plane on a larger support. The thermally sensitive material on which a dynamic display is formed or on

which a permanent display is printed is in direct contact with the monocrystalline semiconductor material of the heating element array and can be passed over the heating element array and the drive matrix.

3,781,516
FUSER CONTROL SYSTEM

George N. Tsilibes; Frank V. D'Amico, and John G. Hamm, III, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1973, Ser. No. 334,167
Int. Cl. G03g *15/20*
U.S. Cl. 219—216 12 Claims



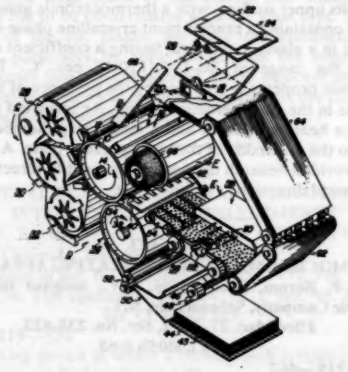
A control system in which a first heat source and a second heat source, cooperating with one another, are regulated for maintaining a moving article at a preselected temperature.

The foregoing abstract is neither intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,781,517
FUSER THERMAL PROTECTOR

Dale William Skamra, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1973, Ser. No. 342,636
Int. Cl. G03g *15/20*
U.S. Cl. 219—216 10 Claims

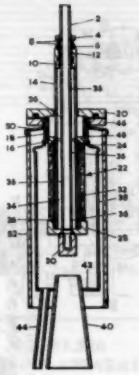


An apparatus arranged to cooperate with a fusing device for preventing the occurrence of an over-temperature condition therein.

3,781,518
VACUUM PUMPS

Basil Dixon Power; Roger Derek Oswald, and David Michael Tooth, all of Crawley, England, assignors to The British Oxygen Company Limited, London, England

Filed June 29, 1972, Ser. No. 267,413
Int. Cl. F22b *1/28*
U.S. Cl. 219—271 5 Claims

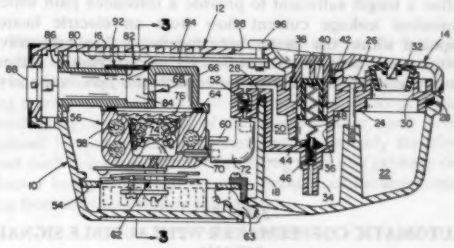


An electrically heated vaporiser particularly for a vapour vacuum pump, comprising a porous electrical heating element through which the liquid to be vaporised is pumped and having means for retaining the mechanical integrity of the heating element despite thermal movements and for reducing heat losses.

3,781,519
HAIR STEAMER

James M. Martin, Chicago, and Michael D. Thomas, Elmhurst, both of Ill., assignors to The Gillette Company, Boston, Mass.

Filed June 12, 1972, Ser. No. 262,043
Int. Cl. F22b *1/28*
U.S. Cl. 219—273 5 Claims



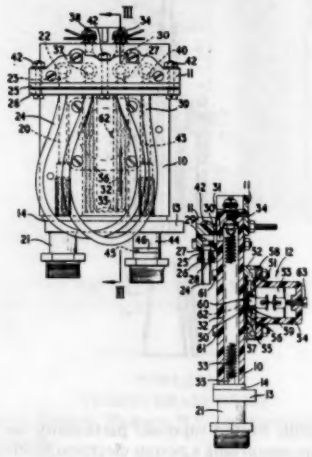
A hair steamer comprising a steam generating chamber having at least one restricted nozzle for delivering a jet of steam, a heater for preheating and maintaining the chamber at a temperature above the boiling point of water, a tank for holding a supply of water separate from the chamber, manually actuatable supply means for introducing a limited quantity of water into the chamber from the supply tank, and air inlet means mounted adjacent the outlet of the nozzle for introducing a controlled quantity of air into the steam jet. A choke is provided for adjusting the ratio of air to steam.

3,781,520

ELECTRIC INSTANTANEOUS WATER HEATER

George William Gardom, Sutton Coldfield, England, assignor to Gardom & Lock Limited, West Bromwich, Staffordshire, England

Filed Dec. 6, 1971, Ser. No. 205,232
Int. Cl. H05b 1/02; F24h 1/10
U.S. Cl. 219—309 23 Claims



An instaneous water heater includes a main electrically insulating body having an inlet and an outlet. A flow duct means extends between the inlet and outlet and includes an inlet bore, an outlet bore, a heater bore means, a first flexible, electrically insulating tube extending between the inlet bore and the heater bore means and a second flexible, electrically insulating tube extending between the heater bore means and the outlet bore. The inlet bore, outlet bore and the heater bore means are formed in the main body while the first and second tubes are formed separately and independently of the main body and each other. A clamping plate connects the ends of the tubes with respect to inlet bore, outlet bore and heater bore means. The tubes together with the inlet and outlet boers define a length sufficient to provide a resistance path which minimizes leakage current flow from an electric heater disposed within the heater bore means. A flow responsive switch means controls current flow the electric heater. A thermostat may be provided in series with the flow responsive switch.

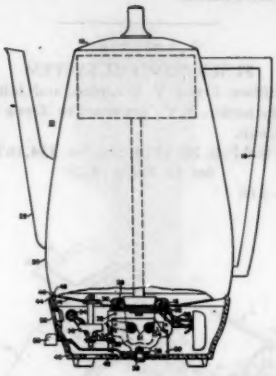
3,781,521

AUTOMATIC COFFEEMAKER WITH AUDIBLE SIGNAL MEANS

Paul J. Kircher, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1972, Ser. No. 218,791
Int. Cl. F27d 11/02
U.S. Cl. 219—442 3 Claims

Signal means to audibly indicate the termination of a cooking or brewing cycle in an automatic electric appliance and the beginning of a cycle wherein a warming heater is employed to maintain the cooked or brewed food-stuff heated. The signal means includes a snap-acting bimetal disposed adjacent the warming heater and a movable pin having one end adjacent one face of the bimetal and the other end disposed a short distance from a bell. Energization of the warming heater causes the bimetal to snap against the pin and drive it against



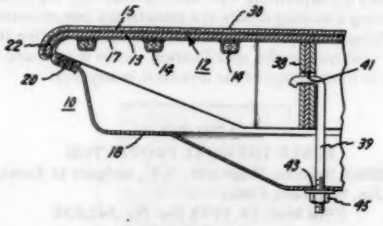
the bell providing an audible signal that the cooking cycle is terminated and the warming heater energized.

3,781,522

THERMOCHROMIC SURFACE HEATING APPARATUS

Marcus P. Borom, Schenectady, and Robert C. De Vries, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,421
Int. Cl. H05b 3/68
U.S. Cl. 219—462 7 Claims



A smooth surface heating apparatus is provided having a heat spreader plate of high thermal conductivity coated, at least on its upper surface, with a thermochromic glass ceramic material containing a predominant crystalline phase of lithium disilicate in a glassy matrix and having a coefficient of expansion in the range of 80–120×120×$^{-7}$ per °C. The thermochromic property is obtained by the presence of basic lead chromate in the glass-ceramic coating. An insulated electrical resistance heating element and a reinforcing member are attached to the underside of the heat spreader plate. A reflector pan is provided beneath the heating element to direct the heat in an upward direction.

3,781,523

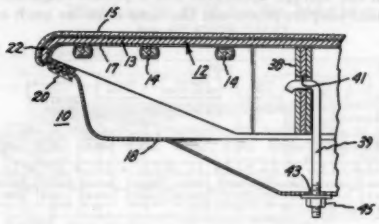
THERMOCHROMIC SURFACE HEATING APPARATUS

Marcus P. Borom, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,422
Int. Cl. H05b 3/68
U.S. Cl. 219—462 7 Claims

A smooth surface heating apparatus is provided having a heat spreader plate of high thermal conductivity coated, at least on its upper surface, with a thermochromic glass-ceramic material containing a predominant crystalline phase of lithium

disilicate in a glassy matrix and having a coefficient of expansion in the range of 80–120×107per °C. The thermochromic property is obtained by the addition of cadmium sulfide and selenium preferably with zinc oxide to the batch ingredients.



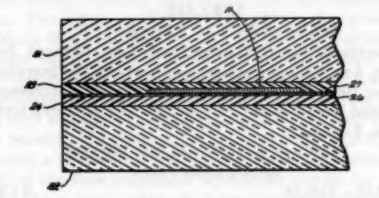
An insulated electrical resistance heating element and a reinforcing member are attached to the underside of the heat spreader plate. A reflector pan is provided beneath the heating element to direct the heat in an upward direction.

3,781,524

EDGE IMPROVEMENT FOR WINDOW WITH ELECTRICALLY CONDUCTIVE LAYER

Berton P. Levin, Santa Monica, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Filed July 3, 1972, Ser. No. 268,827
Int. Cl. H05b *3/06*
U.S. Cl. 219—522 **2 Claims**



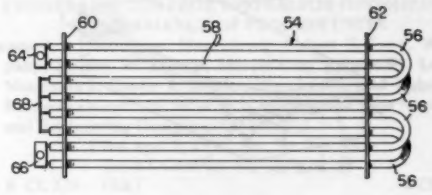
An electrically heatable window has a pair of outboard glass plys sandwiching a pair of transparent plastic interlayers which in turn sandwich a plastic ply or carrier film on which has been deposited an electrically conductive metal coating. Conductive bus bars contact edge portions of the conductive layer for applying a heating current. The conductive layer is applied to a large sheet of the carrier film which is subsequently cut to be co-extensive with the glass plys. The edge portions of the cut plastic ply have the conductive layer removed, preferably by abrasion, so that the edges of the plastic carrier film ply are bonded to the adjacent interlayer. This minimizes electrical hazards and protects the conductive layer from environmental attack.

3,781,525

METAL CLAD HAIRPIN SHAPED ELECTRIC INTERLEAVED HEATING ELEMENTS

Stanley V. Joeckel, Wayne, N.J., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Division of Ser. No. 255,065, May 19, 1972, Pat. No. 3,738,256. This application Nov. 24, 1972, Ser. No. 309,226
Int. Cl. H05b *3/06*
U.S. Cl. 219—532 **3 Claims**

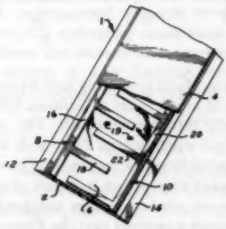
A cooking device in which a frame which is open at the top has a substantially horizontal grill, or grate, disposed therein upon which articles, including articles of foodstuff, can be placed for heating and cooking. The grate is made up of metal clad electric heating elements shaped like hairpins and in overlapped relation. The entire grate is tiltable upwardly at one end and the frame includes detachable front and back corner pieces at the top overlying the ends of the grate. Beneath the grate is a drip pan and the frame is so constructed that, together with the drip pan, it defines flue passages ex-

tending upwardly inside the walls of the frame and then inwardly over the top of the drip pan into the space beneath the grate. All electrical components are sealed in a compartment in the bottom of the frame and on which compartment the drip pan rests.

3,781,526

HEATING APPARATUS

John W. Damron, Dallas, Tex., assignor to Dana International Ltd., Dallas, Tex.

Filed Oct. 26, 1971, Ser. No. 191,989
Int. Cl. H05b *3/02*
U.S. Cl. 219—538 **9 Claims**



Heating apparatus for use as an airplane wing de-icer comprising spaced sheets of impervious electrical insulator material bonded to opposite sides of a sheet of conductive paper having a finite internal resistance. Spaced primary conductors extend along opposite sides of the sheet of paper, each having spaced branch conductors extending transversely therefrom and each branch conductor extending from one primary conductor being positioned between branch conductors extending from another primary conductor.

3,781,527

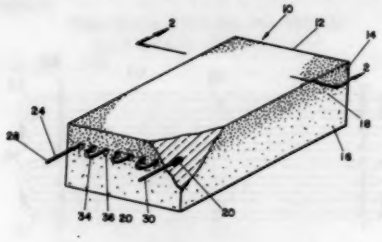
ELECTRICAL HEATER

Romuald W. Tymzcak, Lewiston, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,618
Int. Cl. H05b *3/06*
U.S. Cl. 219—540 **13 Claims**

An improved electrical heating unit useful as a surface cooking element and in a wide variety of other applications comprises a unitary fused silica body having a thermally conductive, normally upper layer consisting essentially of dense fused silica and, fused thereto, a thermally insulating, normally lower layer consisting essentially of closed cell cellular

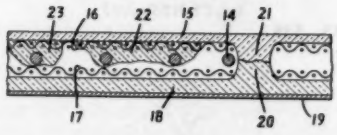
fused silica, one or more channels at the interface of the dense silica and cellular silica layers, and one or more electrical resistance heating elements disposed within said channels and preferably in contact with the dense silica layer.



3,781,528
HEAT RESISTANT, ELECTRICAL INSULATING HEATING UNIT

Nils Gustav Schrewelius, Hallstahammar, Sweden, assignor to Bulten-Kanthal Aktiebolag, Hallstahammar, Sweden

Filed May 30, 1972, Ser. No. 258,099
Int. Cl. H05b *3/02*
U.S. Cl. 219—546 **7 Claims**



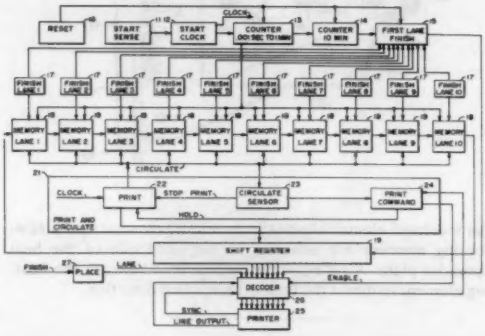
A heat resistant electrical insulating unit having a rigid body of a ceramic material and a layer of ceramic fiber web bound to the ceramic body into a single unit. The unit may have several layers of rigid ceramic and fiber web layers with the fiber web layers spaced from each other and having an electrical resistance element interposed between them, the outermost rigid bodies being joined together mechanically or being welded together in such a manner that the fiber web layers and the interposed resistance element are held clamped between the rigid ceramic bodies. A method is also disclosed for making heating elements wherein a resistance heating element and the insulating layer or layers are joined together into an essentially two-dimensional unit and are placed on a flat glass ceram body which has been heated to a welding temperature, and thereafter a second glass ceram body which has been heated up to body temperature is placed upon and pressed against the first-mentioned body in such a manner that the two bodies are welded together and enclose at least the edge portion of the said unit all around the same.

3,781,529
DIGITAL TIMING SYSTEM

Paul B. Abramson, 3042 Mountain Shadow Dr., Lakewood, Colo., and Robert G. McConnell, 5851 S. Sherman Way, Littleton, Colo.

Filed May 25, 1972, Ser. No. 256,808
Int. Cl. G04f *9/00*; **G06m** *3/06*
U.S. Cl. 235—92 GA **20 Claims**

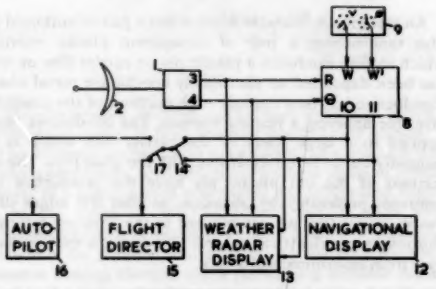
In a digital timing system for simultaneously timing a plurality of events such as swimming races there is provided a signal generator for producing a plurality of distinct binary coded signals in a parallel form representing elapsed time data, each distinct binary coded signal representing a different time digit. Storage apparatus responsive to the end of each event is operative to store the coded signals in a serial form, one event at a time, and upon command present the time data signals in a parallel form one event at a time. Print-out apparatus including a decoder which monitors the parallel outputs from the storage apparatus and a printer responsive to said parallel outputs prints out the time data for each event preferably in a permanent, visible form. A command circuit is operative to cause the storage apparatus to transfer the coded signals into storage in a serial form one event at a time, and recirculates the signals back into the storage apparatus. Event identification, place, and split times may be printed out upon actuation of the command circuit.



3,781,530
NAVIGATIONAL APPARATUS

Colin Morris Britland, Bagshot, and John Bernard Joseph Thorpe, Ash, both of England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 3, 1972, Ser. No. 240,406
Int. Cl. G06f *15/50*
U.S. Cl. 235—150.26 **8 Claims**



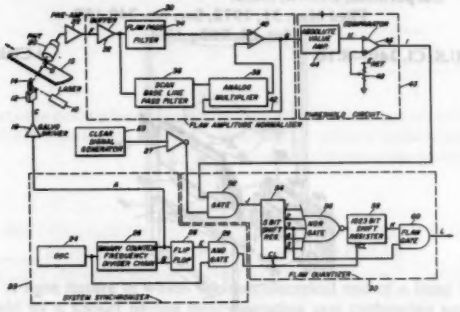
Navigational apparatus comprises a primary hazard sensor, for example a weather radar, for providing signals representing the distribution of hazards ahead of a moving vehicle, connected to a computer. The computer is programmed to compute at least one path substantially avoiding the hazards. An indicator may be connected to an output of the computer to display the paths computed in relation to the hazards. The vehicle guidance system may also be controlled by the computer output so that the vehicle follows one of the computed paths. The computer may be programmed to consider a number of possible paths through a given hazard distribution and to select advantageous paths from those considered for display together with an indication of the risk and economy of each selected path.

3,781,531

FLAW DETECTOR SYSTEM UTILIZING A LASER SCANNER

Cole H. Baker, Westport, Conn., assignor to Intec Corporation, S. Norwalk, Conn.

Filed June 23, 1972, Ser. No. 265,614
Int. Cl. G01n 21/32
U.S. Cl. 235—151.3 7 Claims



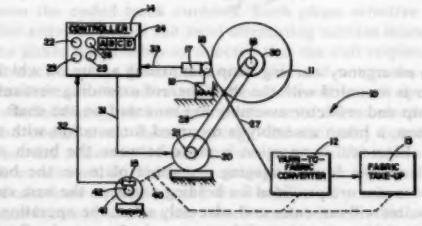
A laser beam is scanned successively across a surface of material being analyzed, and the intensity of the beam, either reflected or transmitted from the material, is detected by a photomultiplier tube. In addition to output amplitude, variations due to scanning across material flaws, other photomultiplier output variations also occur. Such baseline variations are due to relative angle changes that occur between the laser beam and the material surface and other system-associated errors. The same optical and/or electrical variations that produce these baseline signals also cause corresponding amplitude variations of detected flaw signals. A flaw amplitude normalizer circuit is coupled to the detector for automatically normalizing the flaw signal to remove these errors by providing high and low-pass filters to separate the flaw signal from the baseline scanning signal, and these signals are ratioed to develop a normalized flaw signal. A threshold circuit is coupled to the flaw amplitude normalizer circuit for producing flaw output signals when the normalized flaw signals from the detector exceed a predetermined level. Outputs from the threshold circuit are applied to a flaw quantizer circuit which, using "0–1" logic to indicate a flaw area and discriminate against the same indication on successive scans which occur at the same position in the scan as the initial flaw indication, thus provides a single flaw indication for the same flaw, although it may occur on successive scans.

3,781,532

WARP LETOFF CONTROL SYSTEM

Adrian K. Dorsman, Bellflower, and Clark F. Adams, Anaheim, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed May 22, 1972, Ser. No. 255,472
Int. Cl. G06m 1/272; B65h 59/02
U.S. Cl. 235—151.32 20 Claims



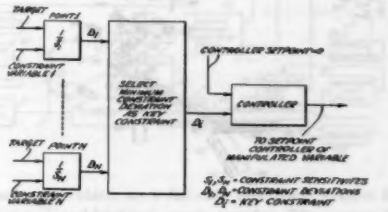
A control system using electronic components to detect and control the operation of a knitting machine. The control system operates to reliably control the length of yarn which is "let off" or removed from a warp (yarn supply) in accordance with the operation of the knitting machine.

3,781,533

CONSTRAINT CONTROL SYSTEM FOR OPTIMIZING PERFORMANCE OF PROCESS UNITS

Leonard A. Barnstone, Morristown; Robert E. Levy, Whippany; Stanley M. Morris, Morristown; Alfredo M. Lopez, Morristown; Henry A. Mosler, Morristown, and Robert J. Bartman, Mendham, all of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed Apr. 7, 1972, Ser. No. 241,959
Int. Cl. G06f 15/46; G05d 21/02
U.S. Cl. 235—150.1 4 Claims



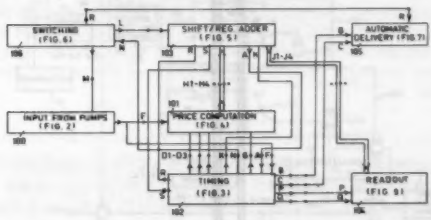
A control system which automatically optimizes the performance of a process unit by continuously scanning the important operating variables, measuring the deviation of these variables from a preselected target, identifying the instant limiting variable, calculating the change in a manipulated variable required to bring the most limiting variable to its target, adjusting the manipulated variable to make the calculated change, correcting operating conditions outside the control system to relieve the instant limit, and repeating the control process to identify a new limiting variable and to make changes needed to bring the new limiting variable to its target.

3,781,534

LIQUID DELIVERY SYSTEMS

James Frederick Bruce-Sanders, 23 Springfield St., Upper Mt. Gravatt, Brisbane, Australia

Filed May 25, 1972, Ser. No. 256,788
Claims priority, application Australia, May 26, 1971, 5002; May 27, 1971, 5013
Int. Cl. G06f 15/20, 15/46; B67d 5/06
U.S. Cl. 235—151.34 7 Claims



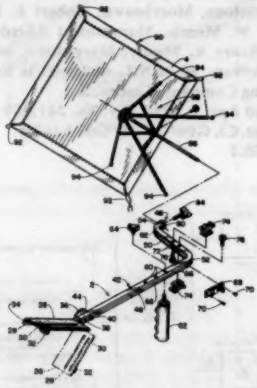
A liquid-delivery pump system includes a sensor providing a pulse for each fractional volume delivered, a pre-set digital circuit representing the price of said volume, means for passing signals representing said price to up-date a digital register each time said pulse is produced and a digital read-out for said register. A plurality of pumps may use a common register by time-division. Button-selected total value or total volume may be dispensed or the pump or pumps may be coin-operated.

3,781,535

PHOTOGRAPHIC REFLECTING DEVICE

Raymond George Larson, 1511 Cranbrook, Lawndale, Calif.

Filed Sept. 17, 1971, Ser. No. 181,298
Int. Cl. G03b 15/02
U.S. Cl. 240—1.3 6 Claims



A universal camera attachment for supporting a reflector member and in an exemplary embodiment a light source in a manner that permits the photographer to properly illuminate the subject matter without interfering with his manipulation of the camera and without hindering his freedom of movement. The salient attributes of the invention are obtained by permitting support of the reflector in a position upward and rearward of the camera with which the invention is utilized.

3,781,536

ILLUMINATED DIVER'S SLATE

Manley H. Naeseth, Panama City, and Herbert Larrimore, Lynn Haven, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 15, 1973, Ser. No. 323,676
Int. Cl. F21v 9/16
U.S. Cl. 240—2.25 10 Claims

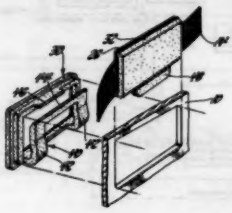
A reusable, illuminated diver's slate or writing tablet which utilizes a charge of chemiluminescent material. Light from the charge, preferably having wavelengths within a predetermined range, is directed through a light transmitting front wall, the surface of which is treated for writing. A mirrored rear wall increases efficiency of light use.

3,781,537

BEZEL ASSEMBLY

Charles W. Ramsey, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1972, Ser. No. 240,187
Int. Cl. B60q 3/04
U.S. Cl. 240—8.16 4 Claims



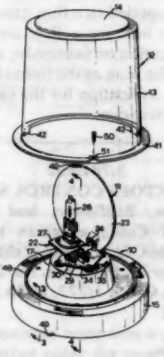
A bezel assembly for securing a fiber optic illuminated legend to an apertured panel includes a bezel insertable through the aperture from the front and carrying an arm which extends through the panel and a backup plate slidably insertable at the rear of the panel between the arm and the body of the bezel to lock the bezel in place. The backup plate carries an illuminable fiber optic ribbon and a legend bearing applique.

3,781,538

EMERGENCY WARNING LAMP

Peter E. Brudy, 111 Angus Dr., and John Smith, 505 Cummer Ave., Apt. 207, both of Willowdale, Ontario, Canada

Filed July 26, 1972, Ser. No. 275,230
Int. Cl. F21m 7/00
U.S. Cl. 240—49 12 Claims

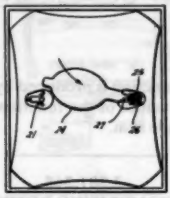


An emergency warning lamp comprising a base on which a motor is mounted with the shaft thereof extending vertically. A lamp and reflector assembly are mounted on the shaft. In addition, a brush assembly is mounted for rotation with the shaft. Electrical connection is made between the brush and the lamp, the brush engaging a contact plate on the base. Novel means are provided for holding a lens on the base such that water will not enter and adversely affect the operation of the lamp. Upon rotation of the motor, the lamp and reflector assembly are rotated.

3,781,539
LIGHT SUPPORT

Leon L. Landrum, Houston, and Robert L. Holder, Nacogdoches, both of Tex., assignors to Esquire, Inc., New York, N.Y.

Filed Nov. 16, 1971, Ser. No. 199,232
Int. Cl. F21v 21/34
U.S. Cl. 240—52 R 9 Claims

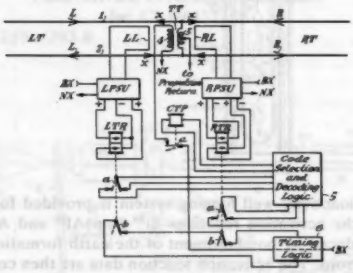


A light fixture in which the non-electrical end of a lamp is held by a socket having heat insulating and cushioning surfaces arranged in a generally conical pattern.

3,781,540
JOINTLESS CODED ALTERNATING CURRENT TRACK CIRCUITS

Crawford E. Staples, Edgewood, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Sept. 18, 1972, Ser. No. 289,971
Int. Cl. B61l 23/30
U.S. Cl. 246—34 CT 10 Claims

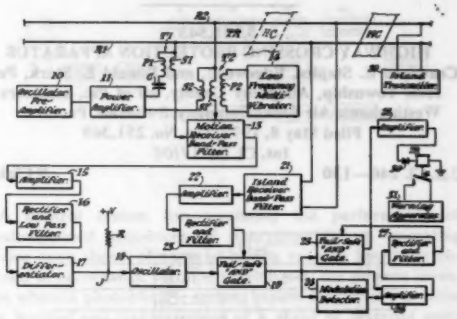


Coded alternating current at the same low frequency is supplied at each location to the rails through a track transformer and transmitted in each direction into the adjoining track sections. The transformer secondary connected across the rails divides the track into sections without insulated joints. At each location, a separate phase sensitive unit is inductively coupled to the rails of each adjoining section to receive energy from the coded track currents. Each phase sensitive unit is also energized from the local alternating current source with the phase relationship so selected that the unit responds only to track current from the distant end and not to the locally transmitted track current. Each phase sensitive unit operates a code following track relay in response to the received distant end coded track current energy and the relay operation is decoded to determine section occupancy and/or advance traffic conditions. A timing logic means controls repeated cycles of alternate reception and transmission of track current at each location to eliminate interference between the local and distant end track currents in each section as received by the phase sensitive unit.

3,781,541
FAIL-SAFE RAILROAD-HIGHWAY GRADE CROSSING PROTECTION SYSTEM

John O. G. Darrow, Murrysville, and Thomas C. Vaughn, Plum Borough, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Sept. 7, 1972, Ser. No. 286,872
Int. Cl. B61l 1/18
U.S. Cl. 246—128 14 Claims

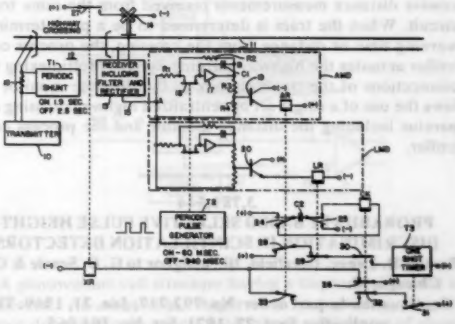


This disclosure relates to a fail-safe electronic system for protecting a railroad-highway grade crossing. The system includes a solid state transmitter for applying a constant current to the track and a solid-state receiver for obtaining a voltage signal from the track. A differentiating circuit senses any differential change between the track voltage and an opposing voltage in order to distinguish an approaching train from a receding train so as to appropriately control the warning apparatus. The integrity of the system is constantly monitored by modulating the track voltage signal so that the absence of the modulating signal activates the warning apparatus to ensure the highest degree of safety to pedestrians and motorists.

3,781,542
HIGHWAY CROSSING SIGNAL CONTROL SYSTEM FOR RAILROADS

Lyle Brockman, Churchville, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 16, 1972, Ser. No. 298,045
Int. Cl. B61l 1/02
U.S. Cl. 246—128 10 Claims



A highway crossing signal control system is provided for railroads having an alternating current transmitter adapted to be connected to the track rails adjacent one side of the highway crossing and having a receiver adapted to be connected to the track rails at the other side of the highway crossing. An approach motion detector is provided for detect-

ing the approach of a railway vehicle to the crossing by sensing a decrease in the input potential to the receiver. Similarly, a leaving motion detector is provided for detecting the leaving of the area of the crossing by a railway vehicle in accordance with sensing an increase in the received potential across the track rails. These motion detectors are respectively used to activate and deactivate a crossing signal. Checking means is provided for normally checking the operability periodically of the motion detectors, and such checking means is operable when active to deactivate the highway crossing signal.

3,781,543

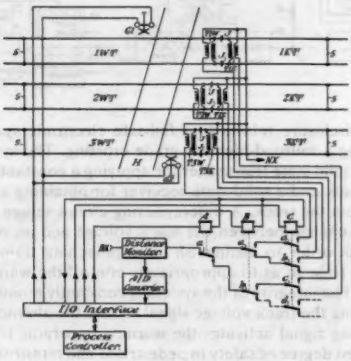
HIGHWAY CROSSING PROTECTION APPARATUS

Crawford E. Staples, Edgewood, and Donald E. Stark, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 8, 1972, Ser. No. 251,369

Int. Cl. B61l *1/06*

U.S. Cl. 246—130 **9 Claims**



Each approach detection track circuit in a multiple track stretch crossed by one or more highways is sequentially connected to a track energy source, including a distance monitor means, by a multiplexing means, shown as a bank of relays operated in repeated cycles by a central process controller. The distance monitor, as it is sequentially connected to each track circuit, provides a distance proportional signal to the central process controller for a train approaching along any track. The process controller registers the detection of the approaching train and determines its continued approach by successive distance measurements received from the same track circuit. When the train is determined to be a predetermined warning time or distance from the crossing, the process controller actuates the highway warning signals. Multiplexing the connections of the track circuits to the distance monitor allows the use of a single set of centralized highway crossing apparatus including the distance monitor and the process controller.

3,781,544

PROBABILITY BASED SELECTIVE PULSE HEIGHT DISCRIMINATION IN SCINTILLATION DETECTORS

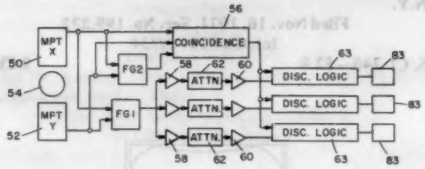
Barton H. Laney, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 792,717, Jan. 21, 1969. This application Sept. 27, 1971, Ser. No. 184,065

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 R **9 Claims**

Pulse height discrimination in a coincidence counting scintillation detector on the basis of the probability of occurrence of a radioactive event having the pulse amplitudes produced, as opposed to the probability of occurrence of background noise having the same pulse amplitudes. The coincident pulses accepted are those which conform to a function that includes at least a major portion of pulse combinations having at least a prerequisite probability of occurrence of a radioactive event.



The determinative function is produced by a function generating means, and the values of the function vary with the coincident pulse amplitude sum.

3,781,545

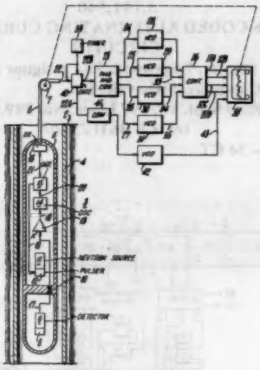
WELL LOGGING COMPRISING DETECTING UNSTABLE RADIOACTIVE ISOTOPES OF ALUMINUM

Hans J. Paap, and Harley L. Tanner, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 26, 1971, Ser. No. 147,151

Int. Cl. G01v *5/00*

U.S. Cl. 250—83.3 R **15 Claims**



A radioactivity well logging system is provided for determining the activation reactions Si^{28} (n,p)Al^{28} and Al^{27}(n,γ) Al^{28} produced by bombardment of the earth formations with fast neutrons. The activation reaction data are then combined with conventional N-γ log data of the same earth formations to assist in distinguishing dry gas hydrocarbon bearing zones from limestone formations. All data necessary for the gas determination may be obtained in one logging run if a pulse neutron source is used. A continuous neutron source may be used in the gas determination method but may require at least two passes of the logging tool over the same depth earth formations.

3,781,546

SELF ALIGNING BEAM WAVEGUIDE HAVING A SERIES OF LENSES AND MEANS FOR MAINTAINING SAID LENSES IN ALIGNMENT

Joseph Robert Christian, Colts Neck; Georg J. E. Goubau, Eatontown, and James W. Mink, Neptune, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

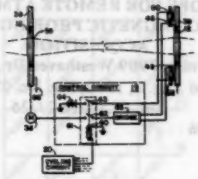
Filed Oct. 29, 1968, Ser. No. 771,539

Int. Cl. G01j *1/20*

U.S. Cl. 250—201 R **12 Claims**

A self-aligning beam waveguide having a series of guiding elements spaced along a path extending between an elec-

tromagnetic beam transmitter and receiver. Associated with each of the guiding elements are radiation detectors for detecting the relative displacement between the beam center and the aperture center of the associated element. A control circuit is connected between a detector located at one element and a realigning motor located at the immediately



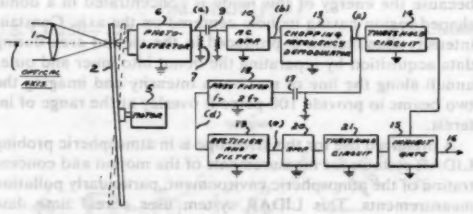
preceding element. The control circuit energizes the motor to cause the associated element to deflect the beam in such a direction as to reduce the amount of displacement between the beam center and the aperture center of the element associated with the detector. A cycling circuit energizes the control circuits one at a time and in succession.

3,781,547

OPTICAL RECEIVER WITH EXTENDED SOURCE DISCRIMINATION

Charles T. Thomas, Dallas, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 22, 1972, Ser. No. 308,888
Int. Cl. G01j 1/20
U.S. Cl. 250—203 R **3 Claims**



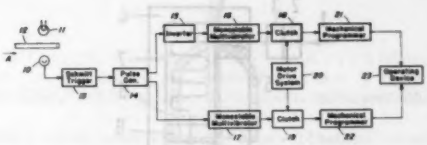
An optical receiver comprising a lens system for forming an image of a distant light source at its focal plane. The light on either side of the focal plane is intercepted by a reticle of alternate opaque and transparent strips of equal widths which move at constant speed and always in the same direction across the light while the reticle continuously oscillates back and forth along the optical axis between extreme positions one of which is in the focal plane of the lens. A photodetector converts the light transmitted by the reticle into a proportionate electrical signal. An inhibit gate located between the output of the photodetector and the receiver output circuit is made to respond to the presence of an amplitude modulation of the AC component of the photodetector output at either the oscillating frequency of the reticle or twice this frequency to prevent an output from the receiver when either of these modulations is present.

3,781,548

CONTROL SYSTEM

Robert E. Gerace, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 5, 1971, Ser. No. 131,114
Int. Cl. H01j 39/12
U.S. Cl. 250—206 R **12 Claims**



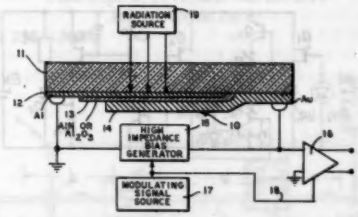
A control system for regulating the performance of predetermined sequences of operations by an operating device upon sheets of material having variable lengths is disclosed in accordance with the teachings of the present invention wherein photoelectric sensing means are utilized to sense the leading and trailing edges of a sheet of material upon which the device operates. Pulse generating means generates first and second pulses when the photoelectric sensing means senses the leading and trailing edges respectively, of a sheet of material. First and second switch means respond to the generated first and second pulses for initiating first and second predetermined sequences of operations respectively, to be performed by the operating device.

3,781,549

USE OF THIN FILM LIGHT DETECTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; George W. Lewicki, Studio City, and Joseph Maserjian, La Crescenta, both of Calif.

Continuation of Ser. No. 88,435, Nov. 10, 1970, abandoned.
This application May 31, 1972, Ser. No. 258,152
Int. Cl. H01j 39/12
U.S. Cl. 250—211 J **2 Claims**

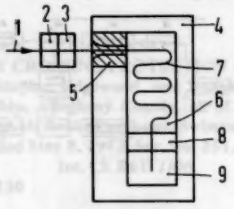


A photovoltaic cell structure having a trapezoidal barrier is disclosed. An aluminum, magnesium or tantalium base is vapor deposited on a quartz substrate to a thickness of about 40 to 60 A. An oxide or nitride film of the base metal is produced as an insulator by reaction in a glow discharge plasma to a thickness of less than 100 A (typically 30 to 60 A), and a metal, preferably, gold counter-electrode is vapor deposited on the insulating layer. A bias generator of high impedance is employed to set and shift or modulate the spectral response of the structure.

3,781,550
RECEIVER FOR LASER BEAMS

Guenter Zeidler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 14, 1972, Ser. No. 262,531
Claims priority, application Germany, Aug. 12, 1971, P 21 40 500.0
Int. Cl. G02b 5/14; H01j 5/16, 39/12
U.S. Cl. 250—211 J 13 Claims

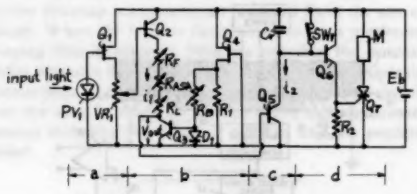


A receiver for receiving laser beams preferably from a laser transmitter of a distance measuring device characterized in that at least a semiconductor photo diode, an amplifying laser, and an optical coupling unit are integrally formed on a carrier member to minimize misalignment therebetween during handling and transporting of the receiver. Preferably, the active material such as neodymium has a high index of refraction and is surrounded by material of a low index of refraction to form a wave conductor which preferably has a serpentine configuration to conduct the received laser beam and amplify it prior to projecting it on a silicon or germanium photo diode. In one embodiment of the invention, the current supply unit for the photo diode, the unit for amplifying the output current of the photo diode, and the power supply unit for the laser are integrally formed on the carrier unit along with the photo diode, the amplifying laser and optical coupler.

3,781,551
ELECTRONIC SHUTTER-CONTROL CIRCUITS FOR CAMERAS

Chiharu Mori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 9, 1972, Ser. No. 224,716
Claims priority, application Japan, Feb. 27, 1971, 46/10095
Int. Cl. H01j 39/12
U.S. Cl. 250—214 P 9 Claims

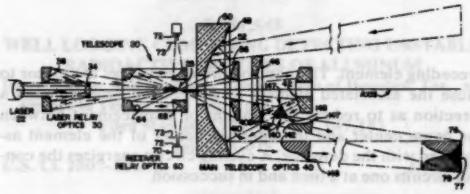


An electronic shutter-control circuit for a camera. The circuit has a constant voltage source section as well as a photosensitive circuit section. The latter section receives light from the object to be photographed and is electrically connected with the constant voltage source section of the circuit to provide from the latter an output voltage whose value is proportional to the logarithmic value of the intensity of light input from the object received by the photosensitive circuit section. The shutter-control circuit also includes a constant current source circuit section, and between the latter section and the constant voltage source circuit section there are connected, in series with the latter sections, a plurality of variable resistors which are in series with each other. With this circuitry, electrical quantities corresponding to object brightness, aperture at the diaphragm, and film speed are logarithmically compressed and a computation is carried out with these logarithmically compressed electrical quantities, to determine an exposure time which is then logarithmically expanded and used for controlling the shutter.

3,781,552
SELF-CALIBRATING MULTIPLE FIELD OF VIEW TELESCOPE FOR REMOTE ATMOSPHERIC ELECTROMAGNETIC PROBING AND DATA ACQUISITION

Kenneth A. Kadrmas, 7909 Westhaven Dr., Huntsville, Ala.

Filed Aug. 2, 1972, Ser. No. 277,437
Int. Cl. G01n 21/26
U.S. Cl. 250—206 13 Claims



The invention is a transmitting and receiving telescope for use in generalized electromagnetic radiation communication systems, including atmospheric probing systems. The telescope optics, electromagnetic radiation source laser and receiver are coaxially aligned along the telscope axis. The telescope can be constructed with one received field of view or with a plurality of received fields of view. The telescope mirrors have apertures along the telescope axis to allow alignment laser pulse or CW radiation to travel along the telescope axis without being reflected. The preferred electromagnetic radiation source is a laser which can operate in both TEM_{00} and TEM_{01} modes. The TEM_{00} mode is employed for alignment purposes since the energy of this mode is concentrated along the axis. The TEM_{01} mode is used for data acquisition because the energy of this mode is concentrated in a donut shaped region having its hole centered on the axis. Constant intensity illumination is produced in the viewed area during data acquisition by separating the donut into inner and outer annuli along the line of maximum intensity and imaging the two beams to provide 100 percent overlay at the range of interest.

A preferred use for this telescope is in atmospheric probing LIDAR systems for measurements of the motion and concentration of the atmospheric environment, particularly pollution measurements. This LIDAR system uses a real time data processing system employing 800 megabit analog to digital converters and a correlation system to transform the acquired data into useable form in real time.

3,781,553
APPARATUS FOR ANALYZING AN IMAGE

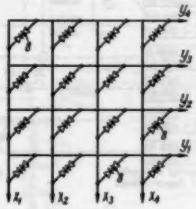
Karina Fridrikhovna Berkovskaya, Prospekt M. Toreza, 18, kv. 120; Nina Vitalievna Lapteva, Karbysheva 6 Korpus 1, kv. 278, and Boris Georgievich Podlaskin, Prospekt Smirnova 15, kv. 34, all of Leningrad, U.S.S.R.

Filed Nov. 28, 1972, Ser. No. 310,076
Int. Cl. H01j 39/12
U.S. Cl. 250—553 6 Claims

The apparatus converts an image into a set of coefficients of Fourier series by systems of two-dimensional functions.

The apparatus includes means for optical reproduction of the image being analyzed, the light radiated by the means being masked in accordance with a law expressed as a set of two-dimensional functions. The radiated light is received by a

matrix of photosensitive cells connected at the intersections of a system of orthogonal buses. During an anlysis, a voltage generator connected to the buses feeds thereto a voltage pattern to render the photo sensitive cells light-responsive and light-irresponsive in groups distributed in space over the area of the matrix in accordance with a successive one of the given



set of two-dimensional functions. Thus, the matrix performs at the same time both the masking and registration of the masked light flux.

The sum total of the absolute values of the electric currents through the photocells becomes proportional to the integrated light flux of the image field, and thus corresponds to a coefficient representative of the shape of the image.

3,781,554

METHOD AND APPARATUS FOR SORTING TOMATOES BY COLOUR

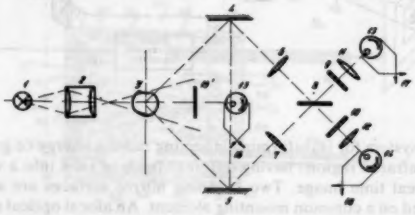
Gueorgui Petrov Krivoshiev; Dimiter Christov Kolev; Christo Yanakiev Tanev; Dimiter Kostadinov Erinkov; Gueorgui Slavov Petrov; Alexander Traykov Vassilev, and Petko Slavtchev Vatev, all of Plovdiv, Bulgaria, assignors to Nii Po Konservna Promishlenost, Plovdiv, Bulgaria

Filed Sept. 27, 1971, Ser. No. 183,917

Claims priority, application Bulgaria, Sept. 26, 1970, 15729

Int. Cl. G01j *3/34*

U.S. Cl. 250—226 **2 Claims**



A method of and an apparatus for sorting tomatoes by color wherein a light beam is projected onto each tomato and transmitted light rays are detected on symmetrically opposite sides of the light beam at angles of 135° thereto, the detected rays are combined through a semitranslucent reflector and a ratio of wave lengths is developed which represents the internal coloration as well as surface flaws in the region of the tomato transluminated by the incident and transmitted beams. The tomatoes are sorted by electromagnetic actuators responding to this ratio.

3,781,555

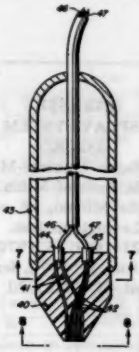
ULTRA-HIGH MOLECULAR WEIGHT POLYOLEFIN OPTICAL READER TIP

Jack D. Keefe, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 2, 1973, Ser. No. 320,544

Int. Cl. H01j *39/12*

U.S. Cl. 250—227 **11 Claims**



There is disclosed an optical reader for reading a record having a wear resistant pen tip made from ultra-high molecular weight polyolefin such as polyethylene of about 1×10^6 to about 6×10^6 M.W. The user can hold the reader in his one hand and scan a binary coded record. In one embodiment, the pen has an elongated housing for mounting a record illuminator, a lens for gathering light reflected or diffused from the record, a mask having an aperture, and a light receptor spaced from the aperture which receives light passing through the aperture. In another embodiment, the polyolefin tip has optical fibers molded therein for transmitting light from the record to a light sensing means. The housing carries a removable, replaceable, tip which is composed of ultra-high molecular weight polyolefin having a low coefficient of friction and a natural lubricity.

3,781,556

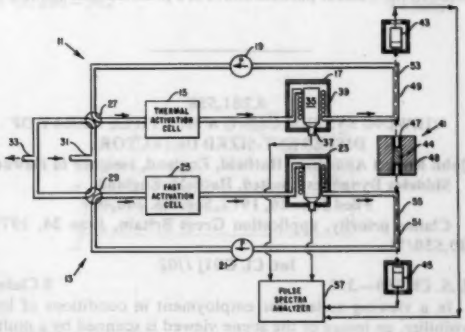
NEUTRON ACTIVATION ANALYSIS SYSTEM

Morris C. Taylor, and John R. Rhodes, both of Austin, Tex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 8, 1972, Ser. No. 287,310

Int. Cl. G01n *23/12*

U.S. Cl. 250—302 **7 Claims**



A neutron activation analysis system for monitoring a generally fluid media, such as slurries, solutions, and fluidized

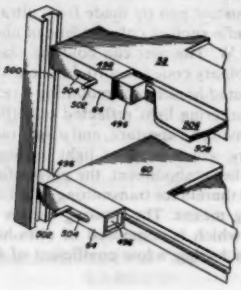
powders, includes two separate conduit loops for circulating fluid samples within the range of radiation sources and detectors. Associated with the first loop is a neutron source that emits a high flux of slow and thermal neutrons. The second loop employs a fast neutron source, the flux from which is substantially free of thermal neutrons. Adjacent to both loops are gamma counters for spectrographic determination of the fluid constituents. Other gamma sources and detectors are arranged across a portion of each loop for determining the fluid density.

3,781,557

RADIOGRAPHIC DISPLAY SYSTEM WITH CASSETTE LOCK

Vitaliano Carugati, Cologno Monzese-Milano; Sergio Colombo; Gianni Ferramola, both of Milan, and Sergio Ferrari, Cernusco Sul Naviglio Milano, all of Italy, assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 81,214, Oct. 16, 1970, Pat. No. 3,733,132.
This application Aug. 17, 1972, Ser. No. 281,568
Int. Cl. G01t 1/20
U.S. Cl. 250—320 **5 Claims**



A nuclear imaging device comprising a plurality of scanning heads spaced apart in a predetermined configuration with the aid of a support member that permits the individual scanning heads to scan in parallel, antiparallel, and tomographic modes. The support member which is driven in both X and Y directions is mechanically connected with the stylus of a graphical X-Y plotter via a backlash linkage. Displays are provided wherein the color of the ink dot on printed paper or the intensity of the light projected on photographic film are related to the nuclear particle count in a preselectable manner.

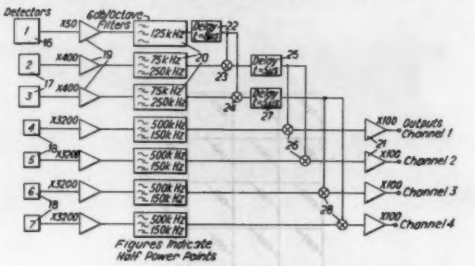
3,781,558

VIEWING SYSTEM USING A MULTIPLE ARRAY OF DIFFERENT-SIZED DETECTORS

John Robert Anderson, Hatfield, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, England

Filed June 26, 1972, Ser. No. 266,409
Claims priority, application Great Britain, June 24, 1971, 29,550/71
Int. Cl. G01j 1/02
U.S. Cl. 250—332 **8 Claims**

In a viewing system for employment in conditions of low visibility, an image of the scene viewed is scanned by a multiple array of effectively different-sized detectors. The individual outputs of the detectors are pre-amplified and filtered and the filtered outputs of the several different-sized detectors viewing the same part of the image are combined on a single output signal channel feeding the display device. The pass bands of the filters are chosen so that the larger-sized detectors provide image detail of lower spatial frequencies and the smaller-sized detectors provide detail of higher spatial frequencies.

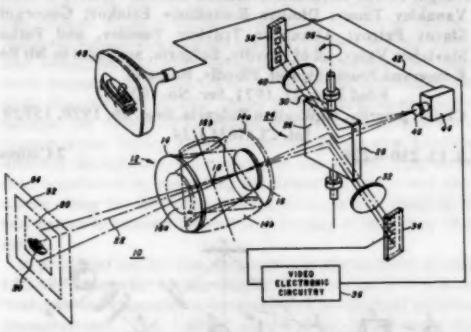


3,781,559

VARIABLE FIELD OF VIEW SCANNING SYSTEM

Erwin E. Cooper, and Howard V. Kennedy, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 19, 1972, Ser. No. 263,918
Int. Cl. G01j 1/00
U.S. Cl. 250—334 **24 Claims**



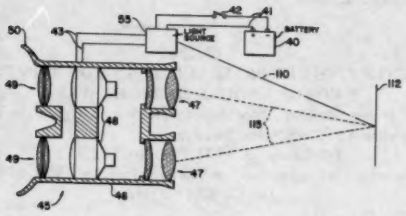
A system for transforming incoming radiant energy (e.g., in the infrared region) having different fields of view into a visible real time image. Two scanning mirror surfaces are supported on a common mounting element. An afocal optical section varies the field of view of the incoming radiant energy. The afocal section accepts incoming collimated radiant energy and produces exiting collimated energy having a different beam diameter thereby changing the field of view of the system without having to modify the basic scanning optics. The collimated radiant energy exiting from the afocal section is reflected from one of the scanning mirror surfaces onto a plurality of detectors. Video circuitry coupling the detectors with a plurality of emitters modulates the emitters to produce light therefrom to be reflected from the other of said mirror surfaces. The image thus scanned is focused on a vidicon thereby producing a video signal that is coupled to a television display which produces a visible image of the incoming radiant energy.

3,781,560

NIGHT VIEWING SYSTEM FOR READING WITHOUT LIGHT

Raymond J. DeBurgh, Palm Springs, Calif., and Harold L. Novick, Wheaton, Md., assignors to Raymond J. DeBurgh, Palm Springs, Calif.

Filed June 7, 1972, Ser. No. 260,420
Int. Cl. G01j 1/02
U.S. Cl. 250—333 9 Claims



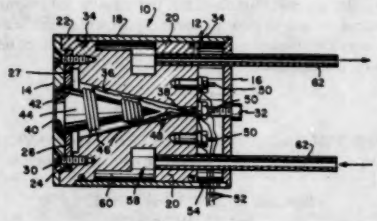
A night viewing system is provided for rendering visible proximate objects located in a totally darkened environment without the use of visible light, the system thus permitting one to read in bed at night without disturbing another person sleeping in the same room. The system comprises a nonvisible light source for irradiating the reading materials and binocular goggles for rendering visible the nonvisible light. The binocular goggles comprise a housing containing appropriate lens systems and a light frequency converter tube for converting the non-visible light into visible light. A strap attached to the goggles housing permits comfortable wearing by the user for relatively extended periods of time.

3,781,561

GRADIENT CONE THERMAL RADIATION SENSOR

Richard P. Clifford, Newport Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 29, 1971, Ser. No. 193,905
Int. Cl. G01t 1/16
U.S. Cl. 250—352 3 Claims



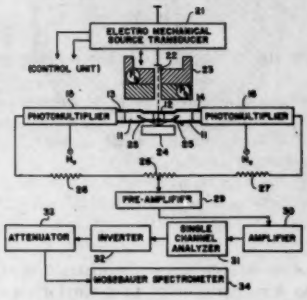
A conical cavity radiometer having a thin-walled thermal receptor cone secured about its open base end to a surrounding hollow heat sink which shields the cone against response to its ambient thermal environment and maintains the base end of the cone at an equilibrium temperature. Thermal radiation entering the open cone end creates a temperature differential between the cone ends proportional to the incident thermal radiation flux. This temperature differential is sensed by temperature sensors attached to the cone ends and is converted to an electrical signal which is an analog of the incident radiation flux. The radiometer is characterized by rapid attainment of thermal equilibrium, high sensitivity, and rapid response to changes in incident radiation flux.

3,781,562

MOSSBAUER SPECTROMETER RADIATION DETECTOR

Jag J. Singh, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 8, 1972, Ser. No. 313,381
Int. Cl. G01j 39/18
U.S. Cl. 250—360 6 Claims



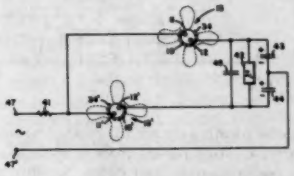
The invention is a versatile Mossbauer spectrometer with high efficiencies in both transmission and backscattering techniques. The heart of the invention is a detector which includes an NaI(Tl) crystal for detecting radiation caused by the Mossbauer effect. The crystal has a hole in its center to allow the collimated incident radiation to pass through and it is coupled through two quartz optical windows to two photomultipliers such that all of the scintillation radiation produced by the radiation detected by the crystal will flow into the two photomultipliers. When used in a transmission technique the sample or scatterer is placed between the incident radiation source and the detector; and when used in a backscattering technique the detector is placed between the incident radiation source and the sample or scatterer such that the incident radiation will pass through the hole in the crystal and strike the sample.

3,781,563

RADIATION DETECTOR

Leslie Richard Linner, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 156,741, June 25, 1971, abandoned.
This application Jan. 29, 1973, Ser. No. 327,535
Int. Cl. G01n 27/00
U.S. Cl. 250—362 5 Claims

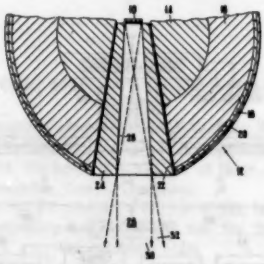


A radiation detector employs two internal ionization type radiation sensors in a circuit such that one sensor aids the other in detection of radiation while each limits the effects of a failure of the other sensor.

3,781,564
NEUTRON BEAM COLLIMATORS

Derek Anthony Lundberg, Hatfield, England, assignor to Elliott Brothers (London) Limited, Marconi House, New St. Chelmsford, England

Filed Feb. 28, 1973, Ser. No. 336,621
Int. Cl. H01j *1/52, 35/16*
U.S. Cl. 250—505 **15 Claims**



A neutron beam collimator comprising a matrix of epoxy resin loaded with particles of tungsten for moderating the neutrons, and with particles of a hydrogenous material for further moderating and capturing the neutrons. A layer of lead is provided to attenuate gamma radiation produced during neutron capture. A slow-neutron absorbing material is intimately mixed with the tungsten to reduce collisions between slow neutrons and the tungsten atoms, thereby avoiding induced radioactivity in the tungsten.

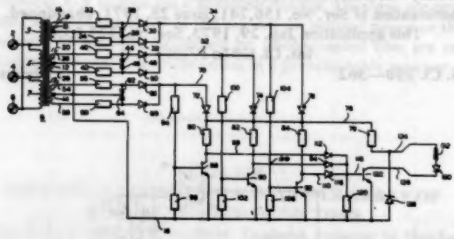
ERRATUM

For Class 250—341 see:
Patent No. 3,781,910

3,781,565
SYNCHRONIZING PULSE GENERATOR FOR COMMUNICATION NETWORK

William Byron Walton, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed July 3, 1972, Ser. No. 268,425
Int. Cl. H03k *3/64*
U.S. Cl. 307—106 **9 Claims**

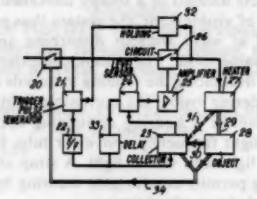


This is a pulse forming circuit for producing uniform height, uniform width, control pulses from a three-phase 60 cycle commercial power source. The power for this pulse forming circuit is obtained from a transformer having three separate output windings electrically spaced 120° from each other. Each of these output windings is center tapped to ground and provided with a carrier signal rejection network and a pair of diodes to form a full wave rectifier circuit for each phase of the three-phase signal. Each full wave rectified signal is applied to the base of a transistor to render it conductive except when the signal approaches zero, at which time the transistor is rendered non-conductive so that a voltage pulse is generated at the collector of the associated transistor. The voltage pulses thus produced at each of the three transistors are combined in a network to produce a signal that controls a fourth transistor to thereby produce a one millisecond pulse signal with a pulse repetition frequency of 360 cycles per second and an amplitude limited by a zener diode. The output of this pulse forming network may be used to energize a light emitting diode which in turn energizes a light sensitive element in a control circuit. One use of this circuit is to provide synchronous clock pulses in a transmit-receive communication network.

3,781,566
DETECTING THE PRESENCE OF A MEDIUM IN THE PATH OF A SOUND OR LIGHT WAVE

Karl Helge Meuller, Stockholm, Sweden, assignor to Helge Meuller AB, Stockholm, Sweden

Filed July 13, 1971, Ser. No. 162,251
Claims priority, application Sweden, July 16, 1970, 9868/70
Int. Cl. H01h *35/18*
U.S. Cl. 307—116 **7 Claims**



A method and system for detecting the presence on an object of media harmful to the efficient operation of the object. The system includes a measuring device having arranged therein a space for receiving the media to be detected, and wave transmitting means arranged at one end of the space and detector means responsive to waves transmitted by the wave transmitting means arranged at the opposite end of the space. The detector means is adapted to transmit a signal to actuator means co-operating with the object served by the system, to remove the harmful media from the object, said signal being dependent on the degree of damping to which the wave from the transmitter means is subjected by the media located in the media receiving space.

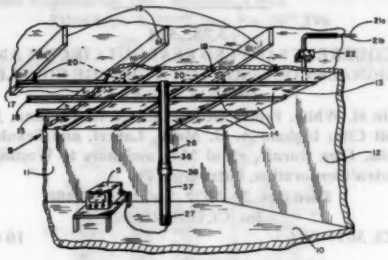
3,781,567
LOW VOLTAGE POWER DISTRIBUTION SYSTEM

William G. Papsco, 145 Willowbrook Dr., Portola Valley, Calif.

Filed Jan. 17, 1973, Ser. No. 324,550
Int. Cl. H02b *1/20*
U.S. Cl. 307—147 **7 Claims**

Low voltage power is distributed throughout a room by one or more exposed suspended ceiling runners, each comprising a pair of panel support members which are electrical conductors, in conjunction with a power take-off post releasably clampable to the runner at a selected location in the room. Electrical energy from a 110-volt power line, for example, is connected to the conductive members of the runner through a step-down transformer so that only low voltage power, say 24 volts, is carried by the runner. The post has a self-contained preferably potted step-up transformer to change the voltage back to 110 volts at a convenience outlet in the post. In a two-wire system one line is connected to ground and the runner and post clamp are non-symmetrically configured to insure

proper interconnection of the ground and hot lines, respectively. The undersides of the runners are protectively covered



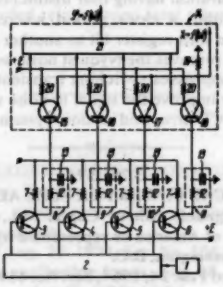
by an insulator so that only the side edges are exposed to the connector clamp on the top of the post.

3,781,568

COHERENT ANALYZER OF FREQUENCY-PHASE SPECTRUM OF ELECTRIC SIGNALS

Boris Ivanovich Goroshkov, ulitsa Metallurgov, 13, korpus 2, kv. 20, and Nikolai Ivanovich Kovshov, ulitsa Utkina, 45, kv. 54, both of Moscow, U.S.S.R.

Filed July 15, 1971, Ser. No. 162,794
Int. Cl. H03d *13/00*
U.S. Cl. 307—232 **3 Claims**



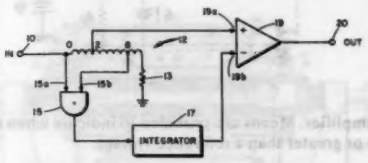
The coherent analyzer of phase-frequency spectrum of electric signals comprises an oscillator electrically connected to a first input of a first electronic gate whose second input is supplied with signals being investigated. The output of the first gate is connected to a first integrating network. The coherent analyzer is further provided with a phase distributor connected to the oscillator output and a group of gates, consisting of at least two gates, the first inputs of which are connected, together with the input of the first gate, to the outputs of the phase distributor. The second inputs of the gates of said group are supplied with electric signals being investigated, and the outputs of these gates are connected to integrating networks of a group of integrating networks whose number equals to the number of these gates connected to an amplitude analyzer. The amplitude analyzer is in turn connected to the output of the first integrating network and to the outputs of the integrating networks of said group, and is so designed that one of the outputs of the coherent analyzer only shows the maximum electrical signal among the signals arriving from all the integrating networks, and the other output shows a signal corresponding to the phase of the signal being investigated.

3,781,569

FAST TIME CONSTANT CIRCUIT MEANS USING TIME DISCRIMINATION TECHNIQUES

Erik Rosenbaum, Randallstown, and John Waldo Martin, Joppa, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 23, 1972, Ser. No. 228,550
Int. Cl. H03k *5/20*
U.S. Cl. 307—234 **4 Claims**



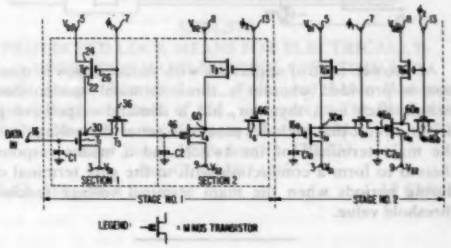
A fast time constant circuit includes a delay line which receives video radar returns. Two delay line time spaced taps are connected through an AND gate to an integrator, the output of which is applied to one input of a differential amplifier. An intermediate delay line tap is connected directly to the second differential amplifier input. The filtered video radar returns appear at the output of the differential amplifier.

3,781,570

STORAGE CIRCUIT USING MULTIPLE CONDITION STORAGE ELEMENTS

Edward Charles Ross, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 200,690
Int. Cl. G11c *11/40*
U.S. Cl. 307—238 **11 Claims**



A storage circuit includes in each stage a metal-nitride-oxide-semiconductor (MNOS) transistor whose threshold voltage is electrically alterable. When the transistors are all at the same threshold level, data bits may be dynamically loaded and stored in the circuit. These bits thereafter may be statically stored by retaining the MNOS transistor of a stage at its original threshold level if the bit stored in that stage is of one binary value and by placing the MNOS transistor at its other threshold level if the bit stored is of the other binary value.

3,781,571

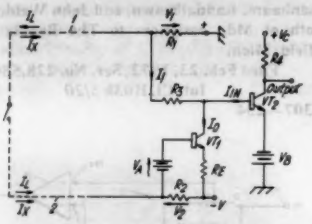
LOOP CURRENT DETECTOR

Michael Robert Lord, Basildon, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 10,365, Feb. 11, 1970, abandoned.
This application Dec. 6, 1971, Ser. No. 205,352
Int. Cl. H04m *3/18*; **H04** *3/06*
U.S. Cl. 307—235 R **6 Claims**

A detector is provided for unidirectional currents flowing in a loop circuit. A dc amplifier coupled to a resistor in the loop provides an output signal proportional to the loop current. A

voltage drop across a second resistor in the loop is supplied to the input of a voltage threshold detector and to the output of



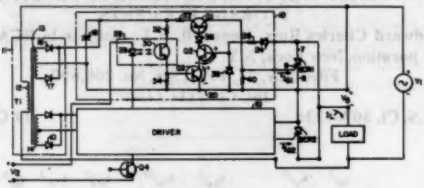
said amplifier. Means are provided to indicate when said input is less or greater than a reference voltage.

3,781,572

AC POWER CONTROL APPARATUS WITH DEMAND RESPONSIVE DRIVER CIRCUIT

Kenneth C. Shuey, Wapakoneta, and Donal E. Baker, Lima, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 27, 1972, Ser. No. 221,276
Int. Cl. H03k 17/72
U.S. Cl. 307—252 T **3 Claims**



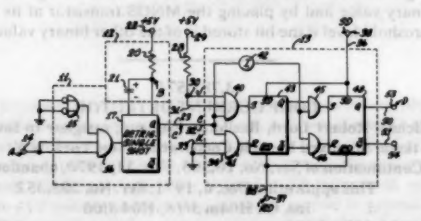
AC power control apparatus with reduced power dissipation is provided wherein a three terminal semiconductor switch, such as a thyristor, has a demand responsive gate driver circuit that includes means to sense the voltage across the main terminals of the switch and a means responsive thereto to form a conduction path to the gate terminal only during periods when the main terminal voltage reaches a threshold value.

3,781,573

SOLID-STATE LONG-PERIOD TIMER

Otto P. Weeden, Jr., Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Sept. 5, 1972, Ser. No. 286,517
Int. Cl. H03k 17/26
U.S. Cl. 307—293 **10 Claims**



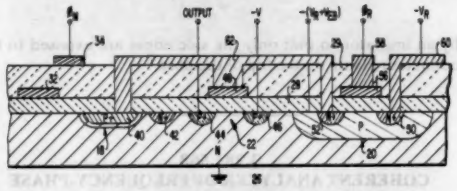
The solid-state circuit employs the combination of a retriggerable one-shot, a timing circuit and a master-slave flip-flop to build a basic timer. This timer can be used as a time-delay relay, a tone decoder, a pulse width detector or as a variety of other timing units which require accurate measurements of time durations.

3,781,574

COHERENT SAMPLED READOUT CIRCUIT AND SIGNAL PROCESSOR FOR A CHARGE COUPLED DEVICE ARRAY

Marvin H. White, Prince George; David H. McCann, Jr., Ellicott City; Ingham A. G. Mack, Laurel, and Franklyn C. Blaha, Glen Burnie, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1972, Ser. No. 299,480
Int. Cl. H01l 19/00
U.S. Cl. 307—304 **10 Claims**



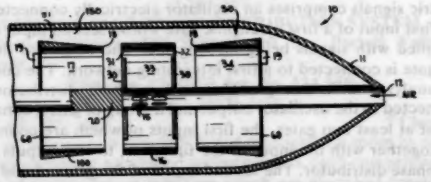
A coherent sampled CMOS readout circuit and signal processor coupled to a CCD shift register operated by a two-phase minority carrier transfer clock system. The invention comprises a multiplex MIS switch, a reverse biased collection diode, an N channel MOSFET reset switch, a P channel MOSFET electrometer amplifier, and a sample and hold circuit, the configuration having four distinct operational timing sub-intervals within a clock period wherein the charge is shifted from one shift register bit to another and finally to the output bit. This removes the Nyquist noise associated with the reset switch, suppresses switching transients and 1/f surface noise to thereby improve the signal to noise ratio, i.e., dynamic range, for a CCD array and readout system.

3,781,575

ELECTRICAL POWER FOR FUZE ACTIVATION

Carl J. Campagnuolo, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 24, 1967, Ser. No. 619,139
Int. Cl. H01v 7/00
U.S. Cl. 310—8.8 **7 Claims**



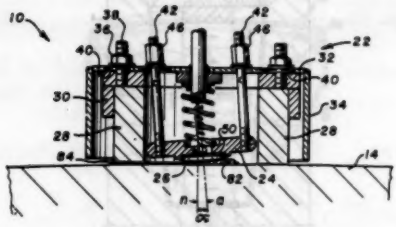
Ram air is passed into the cavities of opposed fluid oscillators. Each oscillator is defined on one end by a diaphragm and a piezoelectric crystal attached to said diaphragm. When the air in the cavity of the oscillator resonates, the diaphragm is vibrated at the resonant frequency of the oscillator causing the piezoelectric crystal to vibrate and produce an electric voltage. The power derived from the piezoelectric crystal may be used to power an electric fuze system within a projectile or missile.

3,781,576

HIGH TEMPERATURE ULTRASONIC TRANSDUCER

Herbert Arthur Runde, Windsor Locks, and Joseph Edward Kowles, Glastonbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 8, 1972, Ser. No. 287,396
Int. Cl. H04r 17/00
U.S. Cl. 310—9.1 12 Claims



An ultrasonic transducer for use in a high temperature environment comprises a support frame supporting a crystal holder in turn supporting a piezoelectric crystal. Biasing means urge said crystal into non-rigid supported relationship with the crystal holder. The crystal surface facing the holder is electrically conductive and an electrically insulating material resistant to high temperatures is located between the crystal and the holder to maintain electrical isolation therebetween.

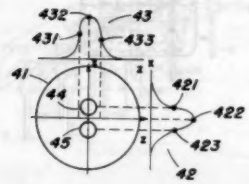
The crystal holder may be movable relative to the support frame to permit extending or withdrawing the crystal into or from an operative position and to allow the crystal orientation to be angularly varied relative to at least a part of the support frame.

3,781,577

PIEZOELECTRIC RESONATOR

Shunsuke Nonaka; Tasuku Yuuki, and Kouichi Hara, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Aug. 25, 1971, Ser. No. 174,894
Claims priority, application Japan, Aug. 28, 1970, 45/75403
Int. Cl. H04r 17/00
U.S. Cl. 310—9.7 1 Claim



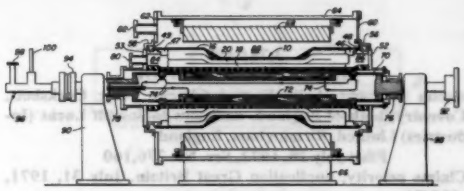
A piezoelectric resonator including a thickness shear piezoelectric element having an electrode on each face thereof, one electrode formed with two apertures spaced in the region of largest expansion and contraction on the geometrical axis in the shearing direction of the element where amplitude vibration is a maximum.

3,781,578

STATOR STRUCTURE FOR ELECTRICAL MACHINE

Joseph L. Smith, Jr., Concord; Philip Thullen, Dover, and James L. Kirtley, Jr., Brighton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 9, 1972, Ser. No. 279,034
Int. Cl. H02k 1/32
U.S. Cl. 310—52 7 Claims



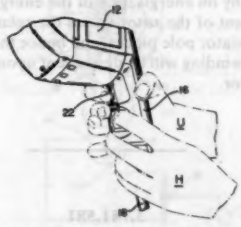
A stator structure for a cryogenic electrical machine including a non-conducting inner support shell; a stator winding unit carried by and fixed to the inner support shell and including a central part in which the stator winding conductors extend axially along the inner support shell, two end parts each having a transverse section in which the conductors extend transversely to their axial direction, an intermediate section in which the conductors extend between an end part and the central part, and an end connection section in which the conductors are interconnected in a predetermined pattern; and a non-conducting outer torque shell having transversely extending filaments surrounding and fixed to the stator winding.

3,781,579

PROTECTED LOCK MEANS FOR ELECTRICALLY-OPERATED, HAND-MANIPULATED TOOLS

Francis Joseph Rosenthal, Jr., Fork, and Lewis Hampton Rohr, Baltimore, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Jan. 3, 1973, Ser. No. 320,732
Int. Cl. H02k 11/00
U.S. Cl. 310—68 A 13 Claims



A portable, hand-held electrically powered tool activated, during operation, by a trigger-type, handle-mounted switch-operator in a convenient position lending to efficient operation of the tool and in which the tool switch has at least an "on" and "off" position. A selectively operable lock means for the switch operator is accessible to the user of the tool but is recessed or protected so that it must be intentionally operated to a "lock" position. The lock means is constructed so that momentary reapplication of manual pressure to the

switch-operator automatically de-activates the lock means and allows the electric motor to turn "off" upon release of pressure on the operator. The lock means is preferably, but not necessarily, located in a central position on the handle of the tool below the switch-operator. In addition, the switch-operator may have two or more "on" positions in which it may be locked.

3,781,580

INDUCTOR ALTERNATOR

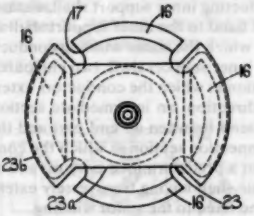
Malcolm Williams, Solihull, and Charles Peter Cockshott, Coventry, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 28, 1972, Ser. No. 276,160

Claims priority, application Great Britain, July 31, 1971, 36,123/71

Int. Cl. H02k *19/20*

U.S. Cl. 310—168 **12 Claims**



A transducer includes a stator formed of a magnetisable material and arranged to define at least one pair of adjacent pole pieces, and a rotor formed of a magnetisable material and arranged to define at least one pole piece. The rotor is movable angularly with respect to the stator from a first position, in which the one rotor pole piece is aligned with but spaced from one of the pair of stator pole pieces by a predetermined air gap, to a second position, in which the one rotor pole piece is aligned with but spaced from the other of the pair of stator pole pieces by a predetermined air gap. The transducer further includes an energising winding for connection to an a.c. source and magnetically coupled with the rotor, and an output winding surrounding one of the pair of stator pole pieces, whereby on energisation of the energising winding, angular movement of the rotor varies the relative flux densities in the pair of stator pole pieces, and hence the voltage induced in the output winding will be dependent upon the angular position of the rotor.

3,781,581

INTERNAL ARRANGEMENT OF ROTOR SLOTS OF ELECTRIC MACHINES

Christian Lehuen, Cravanche, and Roger Gillet, Belfort, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Paris, France

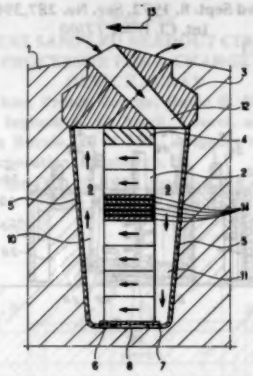
Filed Jan. 5, 1972, Ser. No. 215,574

Claims priority, application France, Jan. 13, 1971, 71.01066

Int. Cl. H02k *3/36*

U.S. Cl. 310—215 **6 Claims**

An internal arrangement of rotor slots for electrical machines, such as turboalternators, in which stacked conductors are carried by the slots and insulating cover caps of the slots have spacing members that protrude on the sides of the



conductors to form ventilating channels between the conductors and the cover caps.

3,781,582

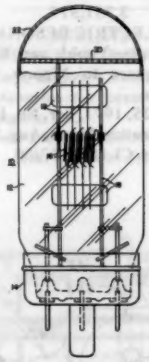
TRIPLE PURPOSE HEAT SHIELD, LIGHT COLLECTOR AND MOUNT SUPPORT FOR A TUNGSTEN-HALOGEN PROJECTION LAMP

Aristide R. De Caro, Edison, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 21, 1972, Ser. No. 265,024

Int. Cl. H01j *61/10, 1/92, 19/46*

U.S. Cl. 313—37 **5 Claims**



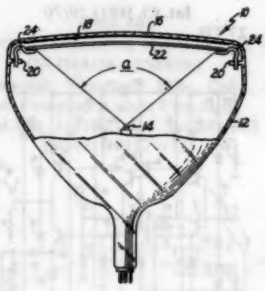
A multi-purpose member used in combination with a tungsten-halogen projection lamp, whereby the multi-purpose member reflects radiation back onto the filament of the projection lamp. The multi-purpose member also serves as a heat shield, a light shield, and a positioning and supporting means for the filament. This combination provides the accomplishment of the several functions at a lower cost than if the functions were provided separately, and also improves the efficiency of the lamp.

3,781,583

ARRANGEMENT FOR A SHADOW MASK IN A SLIM COLOR TELEVISION TUBE AND THERMOSTAT METAL FOR USE THEREIN

Jacob L. Ornstein, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 7, 1972, Ser. No. 278,335
Int. Cl. H01j 29/06
U.S. Cl. 313—85 S 1 Claim



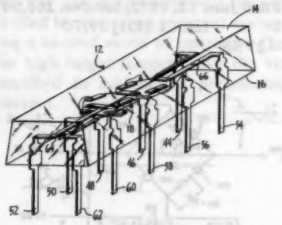
A support arrangement for the shadow mask in a color television tube of slim design is shown to include a plurality of support members formed of a low cost thermostat metal embodying only iron alloy materials, which thermostat metal displays high strength and corrosion resistance at elevated temperatures and displays low flexivity and stable thermal response properties, the thermostat metal having outer metal layers of approximately equal thickness formed of nickel-chromium-iron and nickel-iron alloys respectively and having an intermediate layer of a selected stainless steel comprising between 45 and 65 percent of the total thickness of the thermostat metal providing the thermostat metal with a flexivity in the range from 90 to 110 in the temperature range from room temperature up to about 350°F.

3,781,584

SOLID STATE ALPHANUMERIC INDICATOR AND LEAD FRAME

Richard F. Kingsbury, San Jose, Calif., assignor to Litronix, Inc., Cupertino, Calif.

Filed Mar. 13, 1972, Ser. No. 234,187
Int. Cl. H05b 33/06, 33/14
U.S. Cl. 313—109.5 3 Claims



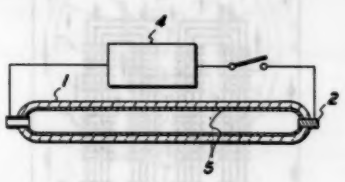
An alphanumeric indicator device in which the alphanumeric character is visible from one face of the device and the terminal pins for effecting electrical connection to the device extend from the opposite face of the device. A method for fabricating the device so as to eliminate the necessity for bending lead frame members after final assembly of the device. An improved lead frame for forming an alphanumeric indicator wherein the final configuration of the lead frame is established at the outset of the fabrication process.

3,781,585

LIGHT PRODUCING SYSTEM

Charles F. Gallo, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 837,881, June 30, 1969. This application Dec. 22, 1971, Ser. No. 210,931
Int. Cl. F21k 5/02
U.S. Cl. 313—184 5 Claims



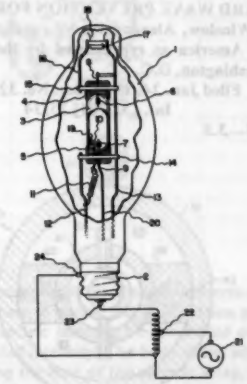
A method is provided whereby a high density of metallic atoms may be obtained in the plasma of a flash lamp by deposition of the desired metal substantially uniformly over the inside of an evacuated tube. Applying a pulse of current which vaporizes the metal produces the desired results.

3,781,586

LONG LIFETIME MERCURY-METAL HALIDE DISCHARGE LAMPS

Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1972, Ser. No. 311,943
Int. Cl. H01j 61/18
U.S. Cl. 313—174 10 Claims



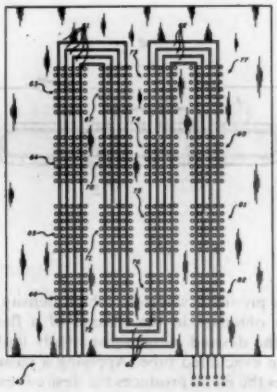
An improved mercury-metallic halide vapor arc discharge lamp in which sodium is present as a principal radiating specie and is added as the iodide to a mercury charge within a discharge envelope either solely or in the presence of other metallic iodides to produce a pleasing near-white emission, contains within the discharge envelope a sufficient quantity of elemental tin to prevent the existence of free iodine therein, thus achieving a greatly extended lifetime.

3,781,587

GAS DISCHARGE DISPLAY APPARATUS

Claude D. Lustig, Lexington, and Albert W. Baird, III, Burlington, both of Mass., assignors to Sperry Rand Corporation, Great Neck, N.Y.

Filed Dec. 1, 1972, Ser. No. 311,067
Int. Cl. H01j 61/06
U.S. Cl. 313—217 15 Claims



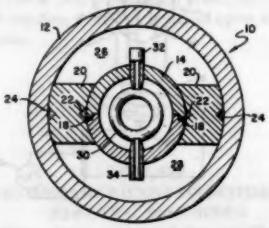
A gas discharge display panel including reservoir cells for providing ionizable gas and a plurality of gas discharge display memory cells. Included are a plurality of addressing electrodes each having a plurality of apertures therethrough, the electrodes being arranged in superposed configuration so that the apertures align to form gas conductive channels extending from the reservoir cells to the display memory cells. The addressing electrodes are adapted for connection to sources of selectable electrical potential whereby gas discharge columns are extended from the reservoir cells through selected channels thereby igniting gas discharges in selected display memory cells.

3,781,588

BACKWARD WAVE PREVENTION FOR A TWT HELIX

Lester M. Winslow, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1973, Ser. No. 326,218
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 3 Claims



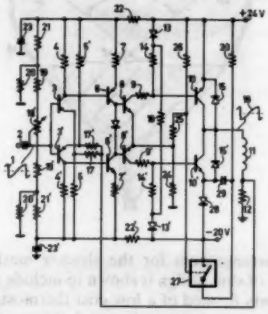
A method of preventing deleterious backward wave oscillations in a high powered traveling wave tube. A loss, introduced at selected frequencies, effects the backward oscillation prevention. This method inherently provides a high heat transfer capability since the loss may be introduced by the moving fluid that dissipates the heat generated in the fluid. The selection of a particular fluid and the dimensions of the hollow support ceramic fluid flow tubes result in selective loss in the range of 6–8 GHz in a TWT designed for operation between 2 and 4 GHz.

3,781,589

FIELD DEFLECTION CIRCUIT

Hans-Jurgen Brockmann, Halstenbek, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1971, Ser. No. 198,832
Claims priority, application Germany, Nov. 28, 1970, P 20 58 631.6
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 8 Claims



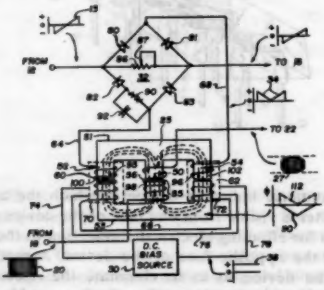
A field deflection circuit in which the deflection coil is connected to a direct voltage source during the flyback period so as to reverse the polarity of the deflection current. For this purpose the deflection coil is connected through a switch controllable connected to the direct voltage source, which switch is controlled by the difference between a voltage proportional to the steep-edged sawtooth input signal and a voltage proportional to the deflection current. This difference is considerable during the flyback period and is utilized for switching on the controllable switch; it becomes zero as soon as the deflection current has reached its required value at which the switch is switched off again. It is thus achieved that the polarity reversal is always terminated when the required value is reached, even when the direct voltage fluctuates and also when the inductive load is changed.

3,781,590

PINCUSHION DISTORTION CORRECTION CIRCUIT

Steven J. Chapman, Wilmette, Ill., assignor to Warwick Electronics, Inc., Chicago, Ill.

Filed June 12, 1972, Ser. No. 261,947
Int. Cl. H01j 29/70
U.S. Cl. 315—27 SR 9 Claims



A saturable reactor in series with a horizontal deflection coil introduces a parabolic reactance variation which corrects

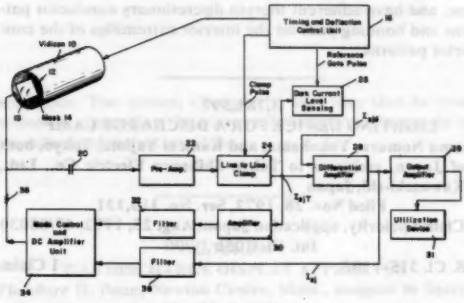
for side pincushion distortion in a television cathode ray tube. A bridge rectifier circuit rectifies a sawtooth output from a vertical deflection circuit to produce a triangular waveform which is applied to one control winding of the saturable reactor. A remaining control winding is coupled to a DC bias source.

3,781,591

SYSTEM FOR CONTROLLING THE TARGET VOLTAGE OF IMAGE SENSORS

Walter H. Bockwoldt, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 31, 1972, Ser. No. 285,282
Int. Cl. H01j 29/52
U.S. Cl. 315—30 9 Claims



Herein is disclosed a system for automatically controlling the target voltage applied to the photoconductor of a television camera so as to provide improved performance over a wide range of photoconductor (target) luminance and temperature conditions. Means are provided for monitoring the dark current read from a masked portion of the photoconductor, and for subtracting the dark current from the total camera's output current to produce a signal, indicative to a substantial degree, of only signal current resulting from scene illumination. The signal current and the total current are processed within an electronic voltage control servo system such that during a first mode of operation (high target luminance and/or low target temperature) the vidicon target voltage is controlled to maintain a constant average signal current; and during a second mode of operation (low target luminance and/or high target temperature) the vidicon target voltage is controlled to maintain a preselected maximum average total current.

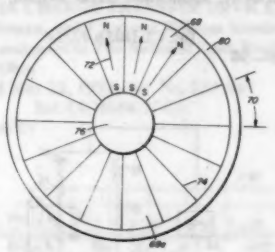
3,781,592

RADIAL MAGNETIZED MAGNET

William J. Harrold, Littleton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed June 8, 1972, Ser. No. 260,879
Int. Cl. H01j 1/00
U.S. Cl. 315—39.71 5 Claims

A permanent magnet package for electromagnetic devices, including traveling wave tubes, linear beam devices, klystrons, magnetrons, crossed field and backward wave amplifiers or oscillators and the like comprising a plurality of radially oriented linearly polarized members collectively providing a magnetic circuit. A soft iron return path between the assembled multi-segmented magnetized components completes the magnetic circuit. Magnetic materials, such as samarium-cobalt, platinum-cobalt, alnico and ferrite may be utilized.



3,781,593

FULL RANGE LIGHT DIMMER ADAPTOR

Edward T. Rodriguez, 70 Meacham Rd., Somerville, Mass.

Filed Sept. 13, 1972, Ser. No. 288,503
Int. Cl. H01j 7/44
U.S. Cl. 315—58 2 Claims

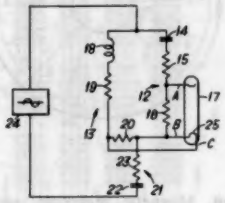
A lamp dimmer adaptor is disclosed for insertion in a conventional lamp fixture to enable the illumination provided by an incandescent electric lamp to be controlled over a large range from dim to full intensity. The body of the adaptor has a socket for accepting the base of the electric lamp. Secured to the body is a hollow base formed by a metallic shell in which is housed a triac and all the other elements of the lamp dimmer circuitry with the exception of the variable resistor. The case of the triac is soldered to the shell to provide a thermal path for dissipation by the shell of heat generated in the triac. The body has a dependent collar which protrudes into the base and a recess in the collar receives the triac case whereby rotation of the base relative to the body is prevented. Above the base, the body has an external flat face which is substantially covered by a large hollow knob housing the variable resistor which controls the level of illumination.

3,781,594

LAMP CIRCUITS

Frank B. Roberts, Gateshead, England, assignor to Victor Products (Wallsend) Limited, Wallsend, Northumberland, England

Filed Nov. 9, 1972, Ser. No. 304,895
Claims priority, application Great Britain, Nov. 18, 1971, 53,633/71
Int. Cl. H05b 41/14
U.S. Cl. 315—98 5 Claims



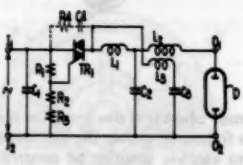
A circuit for operating a fluorescent lamp, particularly in hazardous conditions, comprises two parallel legs including inductive and capacitive reactances, respectively, and a third leg in series with the other legs and including a reactance which forms, with one of the parallel legs, a series circuit which is substantially tuned to the supply frequency. A heater of the lamp is connected across a relatively low value resistance in that parallel leg which forms part of the series tuned circuit, and the lamp electrodes are connected across a relatively high value resistance in the other parallel leg. The tuned circuit provides the necessary voltage for firing the lamp, the reduced impedance of the lamp when fired then damping the tuned circuit. The low resistance of the lamp heater normally shunts the resistance in the tuned circuit, but if the lamp is removed, or the heater becomes open-circuited, that resistance damps the tuned circuit. A second lamp heater may be energised from a transformer in one of the parallel legs.

3,781,595

ELECTRICAL DISCHARGE LAMP

Philip Rufus Samuels, London, England, assignor to The General Electric Company Limited, London, England

Filed May 28, 1971, Ser. No. 147,983
Int. Cl. H05b 39/00
U.S. Cl. 315—101 9 Claims



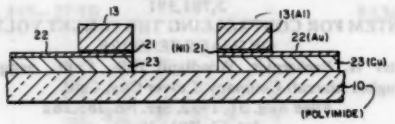
An operating circuit for an electrical discharge lamp comprises a ballast inductance, a semiconductor switching device and a capacitance connected in series between a pair of input terminals, a pair of output terminals across which said capacitance is connected, and a control network for triggering the switching device into conduction for a predetermined part of each of at least one set of alternate half cycles of an alternating current supply connected across the input terminals, to provide a voltage across the output terminals for both starting and running a discharge lamp.

3,781,596

SEMICONDUCTOR CHIP CARRIERS AND STRIPS THEREOF

Richard J. Galli, 2132-A Haven Rd., and Denis G. Kelemen, 6 Gumwood Dr., both of Wilmington, Del.

Continuation of Ser. No. 118,803, Feb. 25, 1971, abandoned. This application July 7, 1972, Ser. No. 269,575
Int. Cl. H05k 3/32
U.S. Cl. 317—101 F 13 Claims



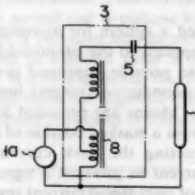
Carriers for packaging semiconductor devices. Strips of such carriers. The carriers comprise a flexible transparent film base, and have adherent thereto discretionary conductor patterns and bonding pads on the interior extremities of the conductor patterns.

3,781,597

LIGHTING DEVICE FOR A DISCHARGE LAMP

Osamu Nomura, Yokohama, and Kanichi Yajima, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 28, 1972, Ser. No. 310,131
Claims priority, application Japan, Aug. 25, 1972, 47/85030
Int. Cl. H05b 39/00
U.S. Cl. 315—105 1 Claim



In a lighting device for a discharge lamp including a ballast inserted between an AC power source and a discharge lamp the ratio Z_C/Z_L of the capacitive impedance Z_C to the inductive impedance Z_L of the ballast is in the range of 1.9–2.8; the ratio V_L/V_S of the nominal lamp voltage V_L of a discharge lamp to the unloaded voltage V_S of a power source is in the range of 0.7–1.1; and when V_L/V_S is in the range of 1.0–1.1, the ratio V_L/V_S is so determined as to satisfy the equation:

$$Z_C Z_L \geqq 9V_L/V_S - 7.1$$

3,781,598

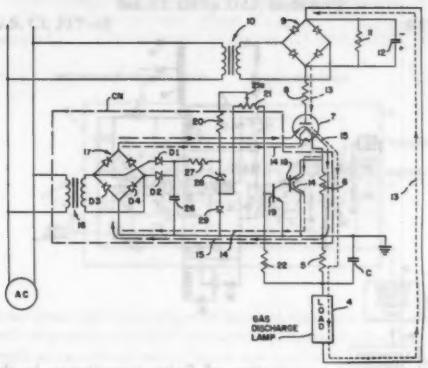
ELECTRIC CURRENT CONTROL APPARATUS

Don F. Widmayer, Bethesda, Md., assignor to Controlled Environment Systems, Inc., Rockville, Md.

Continuation of Ser. No. 818,375, April 22, 1969, Pat. No. 3,659,147. This application Nov. 30, 1971, Ser. No. 203,275The portion of the term of this patent subsequent to Mar. 25, 1989, has been disclaimed.
Int. Cl. H05b 39/04
U.S. Cl. 315—107 5 Claims

A current control system particularly useful but not limited to high voltage non-linear load devices wherein a vacuum

tube, connected in series relationship with the load device and a DC power source, is operated in a controlled electron emis-



sion mode. The current through the load may thus be controlled by controlling the current flowing from the anode to the cathode of the vacuum tube.

3,781,599

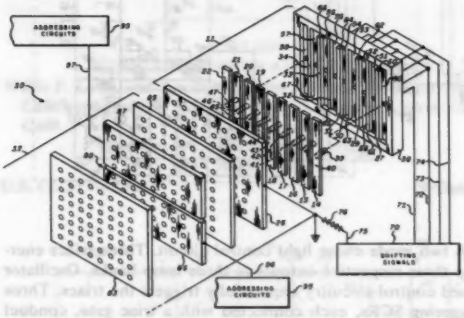
GAS DISCHARGE DISPLAY APPARATUS

Theodore H. Bonn, Newton Centre, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,584

Int. Cl. H05b *37/00*

U.S. Cl. 315—169 TV **21 Claims**



A gas discharge display panel comprises a gas discharge shifting register for propagating glow discharges from stage to stage thereof in response to shifting signals. The apparatus includes a plurality of gas discharge display cells and electrode means interposed between the shifting register and the display cells and having a plurality of gas conductive channels therethrough extending from the stages of the shifting register to the display cells. The electrode means is selectively connectible to a source of addressing potentials generated in timed relation with respect to the shifting signals whereby gas discharge columns are selectively extended in the channels from the glowing stages of the shifting register to the display cells thereby igniting gas discharges in selected display cells.

3,781,600

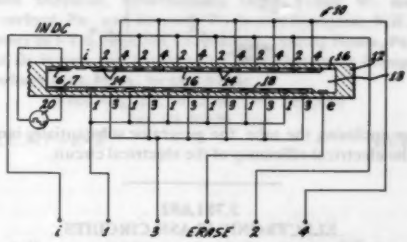
PLASMA CHARGE TRANSFER DEVICE

William Earl Coleman, and Clarence William Kessler, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed May 22, 1972, Ser. No. 255,547

Int. Cl. H05b *37/00*

U.S. Cl. 315—169 TV **20 Claims**



A plasma charge transfer device utilizable as a shift register memory and/or display utilizing ionizable gas contained in an enclosure with a plurality of individual transfer electrodes covered with a dielectric material aligned parallel on opposite internal walls of the enclosure, but offset one another, throughout its length. This plasma charge transfer device utilizes: an ionizable gas; an input electrode which can be either directly or capacitively coupled to the gas; capacitively coupling to the gas of oppositely offset transfer electrodes; and the wall voltage which results when charge is transferred as the result of a gaseous discharge occurring between two oppositely offset transfer electrodes -- the additive effect of this wall voltage to an applied voltage such that a gaseous discharge occurs between two transfer electrodes if charge was transferred to one of the electrodes during a previous discharge whereas a gaseous discharge will not occur with this same applied voltage between any two oppositely offset electrodes which do not have the proper charge trapped on the wall of at least one of the electrode pairs. Upon the proper application of command signals, a gaseous discharge can be successively transferred between subsequent oppositely offset transfer electrode pair, one electrode position at a time, or continuously shifted throughout the entire length of the plasma charge transfer device, or may be held stationary at any oppositely offset transfer electrode pair position within the device. When the plasma charge transfer device is used as a shift register memory, information to be retrieved at the register output may be optically or electronically recognized and erased.

3,781,601

OPTICAL GENERATOR OF AN ELECTROSTATIC FIELD HAVING LONGITUDINAL OSCILLATION AT LIGHT FREQUENCIES FOR USE IN AN ELECTRICAL CIRCUIT

Pavel Imris, West Haven, Conn., assignor to Ecotrol Inc., Columbia, Md.

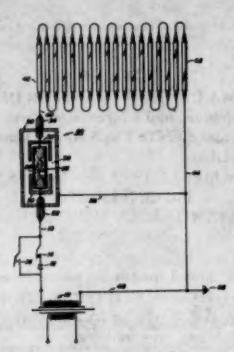
Continuation-in-part of Ser. No. 5,248, Jan. 23, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,034

Int. Cl. H01j *17/04*; **H05b** *37/00*

U.S. Cl. 315—227 **8 Claims**

An optical generator of an electrostatic field at light frequencies for use in an electrical circuit, said generator having a pair of spaced apart electrodes in a gas-filled tube of

quartz glass or similar material with at least one condenser cap or plate adjacent one electrode and a dielectric-filled con-



tainer enclosing the tube, the generator substantially increasing the electrical efficiency of the electrical circuit.

3,781,602

ELECTRONIC FLASH CIRCUITS

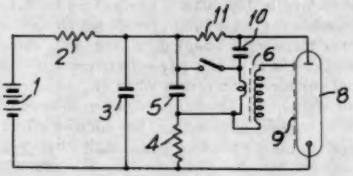
Kinya Tadokoro, Kawasaki, Japan, assignor to Kabushiki Kaisha Sunpak, Tokyo-to, Japan

Filed June 16, 1971, Ser. No. 153,520

Claims priority, application Japan, June 23, 1970, 45/62327

Int. Cl. H05b *41/32*

U.S. Cl. 315—241 P **4 Claims**



An electronic flash device for providing artificial illumination. A main capacitor is connected between the electrodes of a discharge tube to which there is also connected an ignition transformer for bringing the tube into a state of emission. A trigger switch and a trigger capacitor are connected with the transformer for actuating the latter. By way of the trigger switch an additional capacitor is connected in series with the main capacitor so that at its initial period of emission the interelectrode voltage of the discharge tube is augmented by the discharge from the additional capacitor.

3,781,603

CIRCUIT ARRANGEMENT FOR GENERATING A MAINLY SAWTOOTH DEFLECTION CURRENT OF LINE FREQUENCY IN A PICTURE DISPLAY APPARATUS

Antonius Boekhorst, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

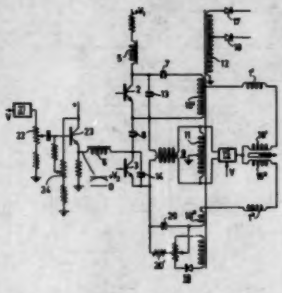
Filed July 8, 1971, Ser. No. 160,658

Claims priority, application Netherlands, July 18, 1970, 7010690

Int. Cl. H01j *29/70*

U.S. Cl. 315—27 GD **9 Claims**

A circuit arrangement for generating an S-corrected sawtooth deflection current of line frequency in a picture display apparatus, the amplitude of which current undergoes a more or less parabolic variation of field frequency for correcting the East-West distortion on the screen of a picture display tube. Two generators, which are substantially decoupled relative to each other, apply a direct voltage to one line deflection coil and the combination of a direct voltage and a field frequency voltage to the other coil. The S-correction is more East-West modulated than the deflection current itself, which is effected



by incorporating a capacitor of finite capacitance in the second generator. The circuit arrangement includes a second capacitor of finite capacitance, either in the first generator or in series with the deflection coil.

3,781,604

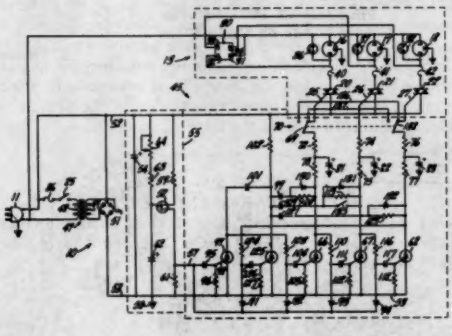
LIGHT CONTROL CIRCUIT

John J. Scarpino, Garden City, N.Y., assignor to Hope-Tronics, Limited, Hempstead, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,707

Int. Cl. H05b *41/34*

U.S. Cl. 315—312 **12 Claims**

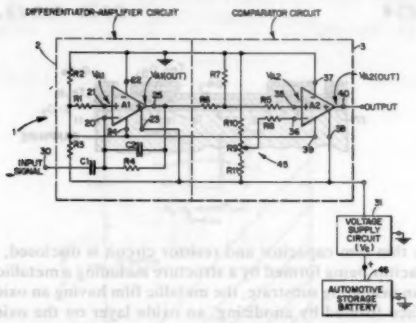


A two mode chase light control circuit. Three triacs energize three respective outputs to three lamp banks. Oscillator timed control circuitry sequentially triggers the triacs. Three triggering SCRs, each connected with a triac gate, conduct sequentially to fire the triacs. In the first mode each SCR conducts until a fourth quenching SCR connects commutating capacitors across the triggering SCRs. In the second mode, a switch bypasses a resistor between one commutating capacitor and a triggering SCR. This reduces the series resistance in a circuit interconnecting the triggering SCRs. The second and third triggering SCRs quench the first and second, diverting current to commutating capacitors. The quenching SCR quenches the third triggering SCR. To reverse the lighting sequence, a switch reverses the trigger connections to the first and the last triacs. Remote discharge lamps indicate the lighting mode, sequence, and timing. A commonly controlled slave triac package controls additional lamps from a separate source.

3,781,605
DC SIGNAL PROCESSING CIRCUIT

Lucian F. Emerson, Williamsport, Pa., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 4, 1972, Ser. No. 311,928
Int. Cl. G01p 3/42; B60t 8/12
U.S. Cl. 317—5 5 Claims

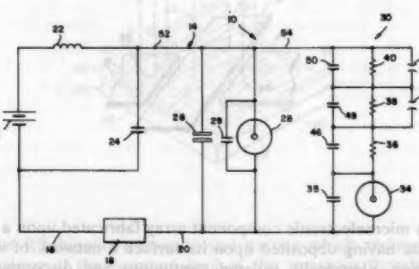


A dc signal processing circuit suitable for use in electronic control module for an automatic anti-skid braking system for vehicles such as automobiles. The processing circuit includes a differentiator-amplifier and comparator subcircuits. The differentiator subcircuit has applied an amplitude-varying dc "voltage" in direct proportion to the rotational velocity of the rear wheels. Instantaneous increases and decreases in the voltage level of the dc "velocity" voltage signal are detected by the differentiator-amplifier subcircuit to produce positive-going and negative-going pulses, respectively, amplified, and inverted thereby. These signals are applied to the camparator subcircuit where the positive-going pulses are compared with a dc "deceleration" reference voltage level having a value corresponding to a predetermined value of wheel deceleration. If the amplitude of a positive-going pulse exceeds the value of the constant dc "deceleration" reference voltage level, an output pulse is produced by the comparator subcircuit to effect operation of the brake-control mechanism of the vehicle to release the brakes and allow the wheels to spin up.

3,781,606
CIRCUIT BREAKER AND METHOD

Willis F. Long, and Kenneth T. Lian, both of Thousand Oaks, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 11, 1972, Ser. No. 313,897
Int. Cl. H02h 7/22
U.S. Cl. 317—11 A 9 Claims

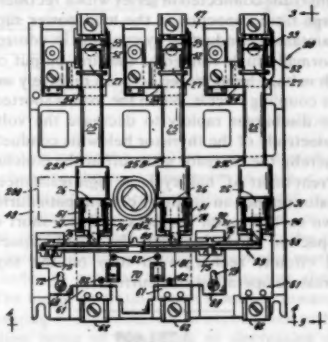


Direct current is interrupted against a high voltage by opening an in-line switch and switching the current into an impedance-increasing section of the circuit breaker. The impedance-increasing section comprises an electronic switching device such as a crossed-field tube serially connected with at least two impedance-increasing resistors. There is a gap in parallel to each of these resistors, except one. As voltage builds up across an impedance-increasing resistor so that the total voltage drop will exceed the desired maximum, the gap breaks down to reduce voltage drop.

3,781,607
DEVICE FOR REMOVABLY MOUNTING ELECTRICAL COMPONENT

Bernard DiMarco, Bellefontaine, Ohio; Frank W. Kussy, Haverford, Pa., and Kenneth W. Swain, Hampton, N.H., assignors to I-T-E Imperial Corporation, Spring House, Pa., by said Di Marco and Kussy and Chase-Shawmont Company, Newbury port, Mass., by said Swain

Filed Aug. 28, 1972, Ser. No. 283,991
Int. Cl. H02h 7/08
U.S. Cl. 317—13 R 6 Claims



A motor controlling system, including a conventional multipole electromagnetic contactor and associated overload relay means, is provided with motor short-circuit protector means in the form of fast-acting fused protector means connected in series with the heaters of the overload relay means and the motor windings. Under overload conditions below locked rotor current, referred to as running overloads, the overload relay means opens the actuating circuit for the contactor holding coil, and under severe fault conditions the fused protector means becomes active to limit let-through energy to a level that will not damage either the motor, contactor, overload relay means, or wiring to the motor.

The overload relay means is chosen from a family of overload relays in which each relay is adapted to protect a motor drawing a different full load current and the fused protector means is chosen from a family of fused protectors in which each protector is adapted to coordinate with a plurality of different relays from said family of overload relays.

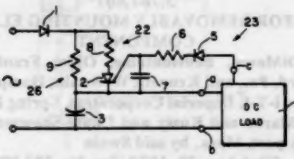
Actuation or melting of a fused protector unit causes an ejector pin thereof to operate a common trip bar which, in turn, opens a switch in the coil circuit. This trip bar is part of an anti-single phasing unit that is selectively positionable with respect to the clips which mount the fused protector units, thereby cooperating with fused protector units of different sizes. These clips are provided with integral formations which serve a blocking or non-interchangeability function, thereby preventing oversized fused protector units from being mounted to the clips.

3,781,608

FAST ACTING CIRCUITRY FOR DC OVERLOAD PROTECTION

Erich Geiger, Friesen, Germany, assignor to Loewe-Opta GmbH, Berlin, Germany

Filed Sept. 7, 1972, Ser. No. 287,092
Claims priority, application Germany, Sept. 8, 1971, P 21 45 538.9
Int. Cl. H02h 3/20
U.S. Cl. 317—20 8 Claims



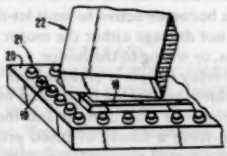
An improved overload protection circuit is associated with a DC load having a first output whose voltage level exhibits a significant decrease in the presence of a short circuit in the load. A thyristor connected in series with a rectifier and a relatively large filter capacitor in the load power supply is normally maintained conductive by coupling its control electrode to the normally high voltage at the first output of the load, such high voltage being stored across a relatively small capacitor in the coupling circuit. When the load is shorted, the small capacitor discharges rapidly to decrease the voltage at the control electrode of the thyristor below its conductive threshhold, whereby the thyristor shuts off at the conclusion of the then-current input AC half cycle. A high-resistance bypass for the thyristor defines an auxiliary current path during thyristor shut-down so that upon correction of the short circuit, the filter capacitor (and therefore the small capacitor in the coupling circuit) recharges to turn on the thyristor and thereby restore operating load current.

3,781,609

A SEMICONDUCTOR INTEGRATED CIRCUIT CHIP STRUCTURE PROTECTED AGAINST IMPACT DAMAGE FROM OTHER CHIPS DURING CHIP HANDLING

Theodore H. Baker; Majid Ghafghaichi, and Paul A. Totta, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,432
Int. Cl. H04l 19/00
U.S. Cl. 317—101 A 7 Claims



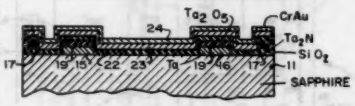
A semiconductor integrated circuit chip structure is provided in which one or more bumper projections extending from the active surface of the chip and spaced from the electrical contact projections on said surface functions to protect said active chip surface from impact damage caused by other chips which randomly contact the chip surface during handling procedures particularly when such handling procedures involve placing the chips in random contact with each other in a vibratory article feeding apparatus, such as a vibratory bowl.

3,781,610

THIN FILM CIRCUITS AND METHOD FOR MANUFACTURE

George E. Bodway, 23200 Mora Glen Dr., Los Altos, Calif.

Division of Ser. No. 56,610, July 20, 1970, abandoned. This application May 22, 1972, Ser. No. 255,890
Int. Cl. H02b 1/04
U.S. Cl. 317—101 A 14 Claims



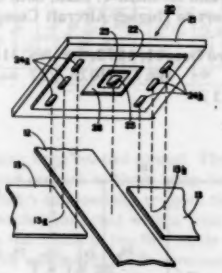
A thin film capacitor and resistor circuit is disclosed, each capacitor being formed by a structure including a metallic film on an insulating substrate, the metallic film having an oxidized surface formed by anodizing, an oxide layer on the oxidized surface of the metallic film, and a pair of spaced-apart conductor layers over the oxide layer, each resistor being formed by a resistive film on the substrate and a pair of spaced-apart conductor layers connecting with the ends of the resistive film. In the manufacture of the circuit, a predeposited substrate is produced that may be utilized by circuit designers in the subsequent fabrication of custom microcircuits. A heat treating technique is employed in trimming the resistors of the circuit.

3,781,611

MICROELECTRONIC COMPONENT ARRAY

Alberto Loro, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada

Filed Nov. 16, 1972, Ser. No. 307,148
Claims priority, application Canada, Oct. 16, 1972, 153965
Int. Cl. H01l 19/00
U.S. Cl. 317—101 A 12 Claims



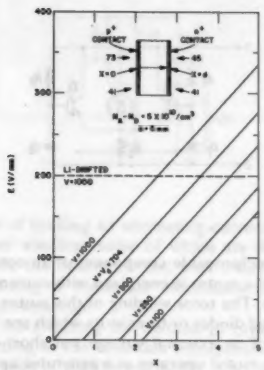
A microelectronic component array fabricated upon a substrate having deposited upon its surface a network of intersecting, electrically isolated continuous and discontinuous conductor strips. Chips, supporting devices in integrated-circuit form - for example, diodes, transistors, etc., - are located at various selected ones or all of the intersections, the metallization of such devices further serving to bridge discontinuous strip ends at such intersections.

3,781,612

METHOD OF IMPROVING HIGH-PURITY GERMANIUM RADIATION DETECTORS

Jorge Llacer, Brookhaven, and Hobart W. Kraner, Bellport, both of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission, Wasington, D.C.

Filed Mar. 28, 1972, Ser. No. 238,822
Int. Cl. H01l 15/00
U.S. Cl. 317—234 R 9 Claims



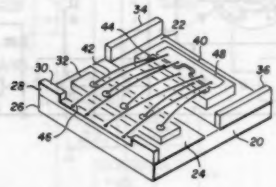
Method for improving the response characteristics of high-purity germanium radiation detectors by irradiation, annealing and etching the detectors.

3,781,613

RF TRANSISTOR CARRIER

Eugene A. Robinson, Dallas, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Oct. 10, 1972, Ser. No. 296,387
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 5 Claims



An RF bipolar transistor and carrier which reduces inductance of the common lead of the transistor thereby increasing operational bandwidth and transistor gain especially in VHF-UHF applications. The carrier includes bonding pads for receiving the transistor and a low ohmage resistor and whereby wire bonds connected to the emitter and base regions of the transistor may be interlaced.

ERRATUM

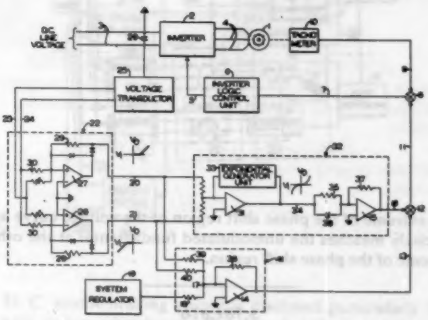
For Class 317—101 see:
Patent No. 3,781,596

3,781,614

INDUCTION MOTOR CONTROL SYSTEM

Boris Mokrytzki, Murrysville, Pa., and Peter W. Hammond, Chagrin Falls, Ohio, assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed July 31, 1972, Ser. No. 276,540
Int. Cl. H02p 5/40
U.S. Cl. 318—227 9 Claims



This invention covers an auxiliary control system for automatically changing the operating point of an a. c. induction motor independent of normal control thereof in order to counteract voltage deviations either above or below a preselected range in which supply voltage to the input of a solid state inverter device controlling the motor must be maintained in order to prevent inadvertent system shutdown or damage. The motor operating point is moved toward a condition of motoring or regeneration, in accordance with the voltage deviation being of increasing or decreasing character, respectively, in order to adjust the level of power demanded by the motor and thereby counteract the voltage deviation until the inverter input voltage is restored to the desired level. The system is particularly useful in permitting the kinetic energy of a moving body, such as a railway vehicle, to provide regenerative voltage for maintaining inverter input voltage during periods of power interruption, such as occur in traversing line gaps.

3,781,615

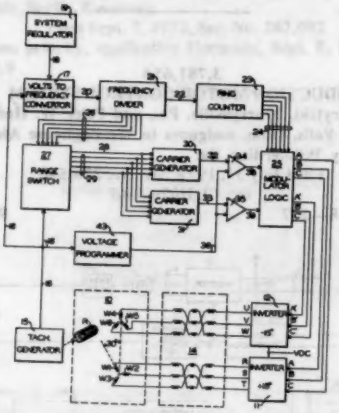
SYSTEM FOR PHASE SHIFTING INVERTERS TO OBTAIN A VARIABLE MODULATED WAVEFORM

Boris Mokrytzki, Murrysville, Pa., and Udo Meier, Luzern, Switzerland, assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 24, 1972, Ser. No. 299,932
Int. Cl. H02p 5/40
U.S. Cl. 318—227 11 Claims

A a. c. motor drive system for effecting fundamental voltage modulation by phase shifting inverters coupled in parallel, thereby providing a gradual voltage change between a minimum pulse width modulated waveform and an unmodulated waveform to overcome surges experienced in the transition therebetween. A voltage programmer produces a control signal predicated on vehicle speed so as to follow a preselected profile computed to control the degree of inverter

phase shift so that the phase shift modulated fundamental precisely matches the pulse width modulated fundamental at



one extreme of the phase shift region of the voltage curve and precisely matches the unmodulated fundamental at the other extreme of the phase shift region.

3,781,616

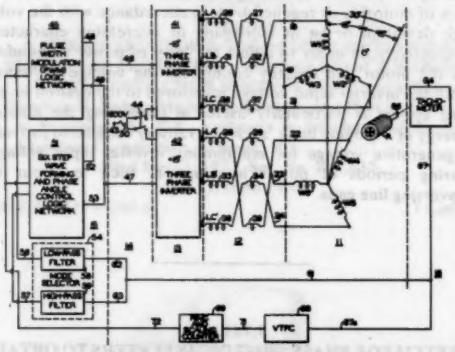
INDUCTION MOTOR CONTROL SYSTEM

Boris Mokrytzki, Highland Heights, and Peter W. Hammond, Chagrin, both of Ohio, assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 13, 1971, Ser. No. 188,949

Int. Cl. H02p *1/30*

U.S. Cl. 318—230 **22 Claims**



This disclosure relates to a control system for dynamically reenergizing a rotating induction motor. A pair of inverters supply power to the windings of the induction motor through an inductive reactor. A tachometer senses the rotational speed of the rotor of the induction motor and applies a signal to a programmed logic circuit for pulse width modulating the power of the inverters over a constant torque range and for step wave shaping the power of the inverters over a constant horsepower range. In the event of a interruption of power, the reapplied power to the induction motor is reduced and the frequency of the reapplied power is readjusted at or near the actual synchronous speed of the induction motor so that little, if any, current surges occur upon reenergizing of the induction motor.

3,781,617

REVERSING DRIVE WITH BRAKING FOR OPTICAL COMPONENTS

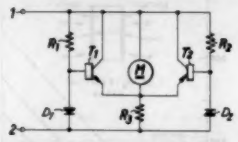
Otto Thomas, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Kreuznach, Rhineland, Germany

Filed May 24, 1972, Ser. No. 256,279

Claims priority, application Germany, May 26, 1971, P 21 26 132.5

Int. Cl. H02p *3/12*

U.S. Cl. 318—261 **6 Claims**



To displace a reciprocable component of an optical objective, a reversible d-c motor is energized with current of one or the other polarity. The rotor winding of this motor is shunted by oppositely poled diodes or transistors which are ineffectual in the presence of an external voltage but short-circuit the winding when the motor operates as a generator upon disconnection from the supply, thereby arresting the motor.

3,781,618

ELECTRIC DRIVING APPARATUS

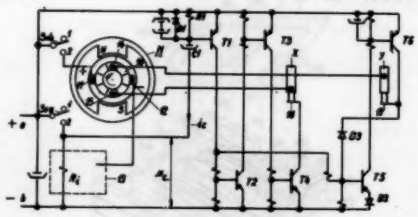
Stanislaw Kruszynski, Lutry, Switzerland, assignor to Bolex International SA, Saint-Croix, Switzerland

Filed July 27, 1972, Ser. No. 275,804

Claims priority, application Switzerland, July 30, 1971, 11233/71

Int. Cl. H02k *13/00*

U.S. Cl. 318—265 **4 Claims**



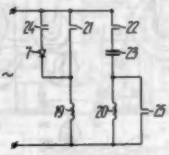
An electric motor drive having a rotor that is brought to a stop in a predetermined angular position whenever the mechanism ceases to move. The motor includes a segment type commutator as well as a slip ring and means of applying a blocking voltage to the slip ring to produce a rotor induced magnetic field of fixed orientation in relation to the rotor. Means are also provided to control application of stopping current only when the rotor is in a stable stopping position.

3,781,619

METHOD OF BREAKING ALTERNATING-CURRENT ELECTRIC MOTOR AND DEVICES EMPLOYING THIS METHOD

Mikhail Pavlovich Rashkovich, ulitsa Chkalova, 10, kv. 28; Alexandr Ljudvigovich Kon, ulitsa Sverdlova, 95, kv. 1; Nikolai Konstantinovich Shaparev, ulitsa Tereshkovoi, 14, kv. 42; Boris Isaakovich Shklovsky, ulitsa Pushkinskaya, 8, kv. 5, and Grigory Abramovich Leibovich, ulitsa Perekopskai Pobedy, 17, kv. 4, all of Odessa, U.S.S.R.

Filed May 17, 1972, Ser. No. 254,312
Int. Cl. H02p 3/20
U.S. Cl. 318—211 4 Claims



A method of braking an alternating-current electric motor having power windings some of which are deenergized and shorted, while the others are fed with a half-wave rectified current inducing a rotational electromotive force in the shorted power windings.

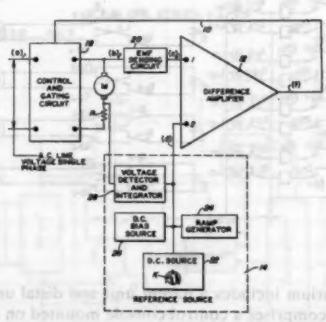
A device for effecting the method of braking an electric motor according to the invention incorporating a rectifier in the power circuit of the electric motor. Also included into the power circuit of the electric motor are the contacts of an operating starter, said contact being inserted between the motor terminals and the power supply mains. In this case the contact of the braking starter is connected in parallel to the power winding of the electric motor, while the contacts in series with the rectifier are connected parallel to the contacts of the operating starter in the power windings of the motor thus feeding the windings from the power mains through the rectified-current circuit in the process of braking.

3,781,620

FULL WAVE GOVERNOR CONTROL SYSTEM

Tibor E. Toth, Congers, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,202
Int. Cl. H02p 5/16
U.S. Cl. 318—331 8 Claims



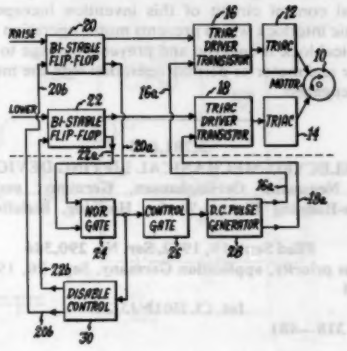
A full wave governor control system for a DC motor which regulates the motor speed in response to an error control signal derived by sensing the emf of the motor and comparing it to a reference signal which varies periodically from a first DC potential to a second and higher DC potential at a rate in synchronism with each half-cycle of applied alternating line voltage.

3,781,621

D.C. MOTOR BRAKING CIRCUIT ESPECIALLY FOR USE WITH VOLTAGE REGULATORS

Richard D. Blackburn, Dalton, Mass., assignor to General Electric Company

Filed June 21, 1972, Ser. No. 264,865
Int. Cl. H02p 3/24
U.S. Cl. 318—373 10 Claims



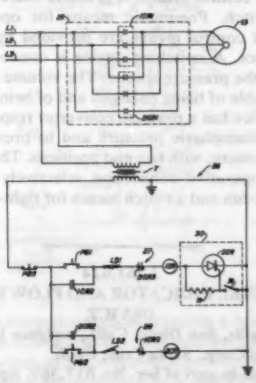
A D. C. motor braking circuit is disclosed particularly for use with voltage regulators. The circuit utilizes a bilateral transistor which is turned on by the action of the voltage regulator control device to energize a pulse transformer which will apply a D.C. braking current to the motor of the voltage regulator through diodes. To prevent control instability, a pair of transistors are provided which are turned on during the braking period to prevent the control circuit of the voltage regulator from operating.

3,781,622

ELECTRONIC INTERLOCK FOR DOOR OPERATOR

Floyd Acton; Paul E. Cochran, and William G. Moore, all of Columbus, Ohio, assignors to Kinnear Corporation, Columbus, Ohio

Filed Oct. 24, 1972, Ser. No. 300,173
Int. Cl. H02p 1/00
U.S. Cl. 318—466 6 Claims



An electrical control circuit for a door operator is provided having an electronic interlock. Doors or closures of the type for which this electrical control circuit and interlock are in-

tended to be utilized are of a type known as a roll-up door having a plurality of hingedly interconnected slats or panels. This type of door may be opened through roll-up of the hinged slats. Closures of this type are often of a large physical size requiring electrically driven motors for operation. A control circuit is provided permitting selective operation of the electrical drive motor in the desired direction and mechanical locking means is usually provided to secure the closure in a closed provision relative to the opening. An interlock must be provided to prevent inadvertent operation when the mechanical lock is securing the closure in this closed position. The electrical control circuit of this invention incorporates an electronic interlock which prevents motor operation when the mechanical lock is engaged and prevents damage to the door operator and motor or permits operation with the mechanical lock disengaged.

3,781,623

ELECTRO-MECHANICAL LIFTING DEVICE

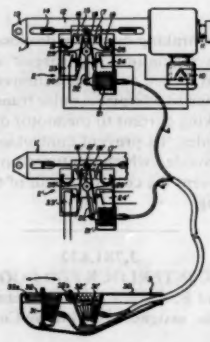
Gernot Neumann, Oerlinghausen, Germany, assignor to Firma-Hanning Elektro-Werke, Hanning, Bielefield, Germany

Filed Sept. 19, 1972, Ser. No. 290,346

Claims priority, application Germany, Sept. 20, 1971, P 21 46 934.1

Int. Cl. H01h *35/24*

U.S. Cl. 318—481 **4 Claims**



An electro-mechanical lifting device, in particular for bed adjustments, which comprises a driving motor including switching and control means. A pressure source is received in a manual switch. Pneumatic means for operation of the switching and control means are provided by means of the pressure source. A switching device is connected by a hose conduit with the pressure source. The volume of the pressure source is capable of being enlarged and of being reduced. The switching device has a pressure converter responding to pressure below atmospheric pressure and to pressure above atmospheric pressure, with two end positions. The pressure converter is in operative connection selectively with a switch means for left-run and a switch means for right-run of the driving motor.

3,781,624

LIQUID LEVEL INDICATOR AND FLOW MEASURING DEVICE

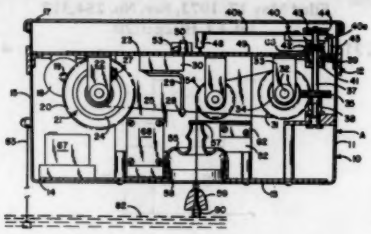
Reuben C. Tullis, San Diego, Calif., assignor to Manning Environmental Corp., Santa Cruz, Calif.

Continuation-in-part of Ser. No. 817,369, April 18, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 100,049

Int. Cl. G01f *23/10*; **H02p** *3/00*

U.S. Cl. 318—482 **7 Claims**

A portable device is provided for mounting above a conduit or trench adapted to contain a moving liquid, such as water, sewage, and the like, and to rapidly and effectively measure and record the depth of flow. Such measurement may relate only to liquid level depth or, alternatively, may be employed in accordance with Manning's Formula to provide a recorded indication of volume of flow. A weighted electrically conductive probe is automatically reeled out upon a cable from a measuring and recording device, so as to locate the upper level of



electrically conductive liquid flowing beneath the device, and upon command such probe also locates the invert of the conduit or bottom level of the liquid. A particular probe design is provided for location of the upper level of flowing liquid, particularly under circumstances wherein such level may rapidly vary and, furthermore, the invention is adapted to accommodate circumstances wherein no liquid is present in the conduit or trench above which same is mounted.

3,781,625

PLURAL MOTOR, PLURAL CONTROL STATION PLANETARIUM

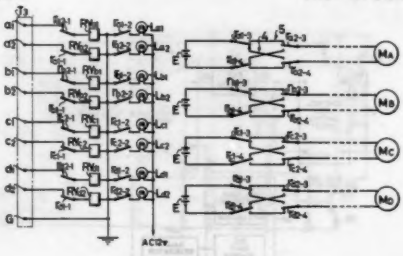
Tohru Miyajima, Sakai; Yoshiharu Ichimoto, Izumi, and Arinori Saeki, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 8, 1971, Ser. No. 104,942

Claims priority, application Japan, Sept. 30, 1970, 45/86135

Int. Cl. H02p *7/20*

U.S. Cl. 318—547 **8 Claims**



A planetarium includes a parent unit and distal units. The parent unit comprises a control console mounted on a operation unit for controlling motion mechanisms generally incorporated in the planetarium. The distal units are disposed on some of the seats for the spectators or students and enable them to control the motions of the planetarium through the parent unit. The controlling operations of the distal units are coordinated by electric circuits so as to eliminate interference therebetween. The control operations on the distal units are indicated on the parent unit.

3,781,626

OPTIMIZED P.I.D. CONTROLLER

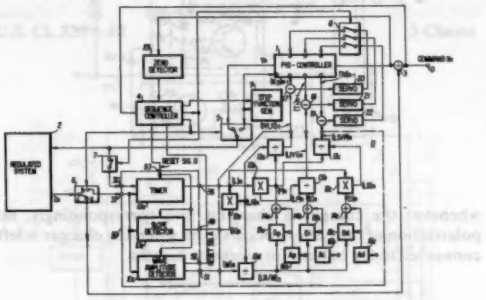
Moritada Kubo, Tokyo, and Yukiharu Takahashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Company Ltd., Kawasaki-shi, Kanagawa-ken, Japan

Filed Dec. 30, 1971, Ser. No. 214,121

Claims priority, application Japan, Dec. 31, 1970, 45/123665

Int. Cl. G05b *13/00, 11/42*

U.S. Cl. 318—561 3 Claims



A system is disclosed for optimizing the operation of remote controlled devices or systems which are subject to changing response characteristics, due for example, to widely varying load conditions. The disclosed system includes a testing network for measuring the response of a remote controlled device or system to known inputs. A computing network is provided for generating control coefficients from the outputs of the testing network. The control coefficients generated by the computing network are used to modify the operation of a central control unit in response to the changing characteristics of the remote controlled device. When the remote controlled device returns to its normal, or no load, condition, the disclosed system also reverts to its normal operating parameters.

3,781,627

DIGITAL MULTIPLEX SERVO CONTROL

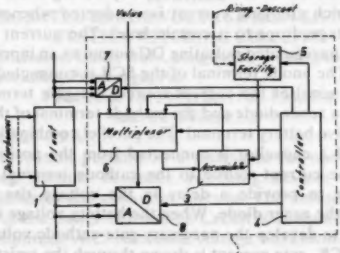
Hurst Binnig, Kleistweg 43, Delmenhorst; Jurgen Freyen, Hinter den Hofen 52, Kirchweyhe, and Dirk-Friedrich Middelmann, Hordestrasse 6, Schwerte, all of Germany

Filed June 26, 1972, Ser. No. 265,968

Claims priority, application Germany, July 14, 1971, P 21 35 045.8

Int. Cl. G05b *11/32*

U.S. Cl. 318—562 4 Claims



A digital controller with a single multiplexor handling inputting of controlled variables, commands and modifier signals, further handling the output-to-input data circulation of ALU-accumulator unit, and the output of actuator control signals.

3,781,628

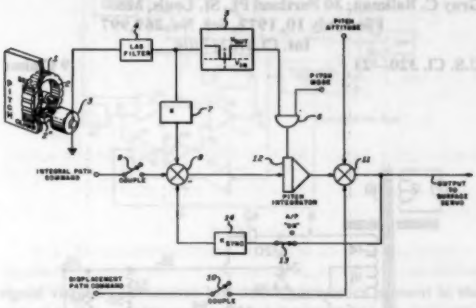
AUTOPILOT PITCH ATTITUDE CONTROL

Paul A. Rauschelbach, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 61,964, Aug. 7, 1970, Pat. No. 3,688,175. This application Mar. 29, 1972, Ser. No. 239,122. The portion of the term of this patent subsequent to Aug. 29, 1989, has been disclaimed.

Int. Cl. B64c *13/18*; G05d *1/08*

U.S. Cl. 318—584 10 Claims



A manually operated pitch wheel, not requiring any centering, synchronizing, or detents, is used to adjust the pitch attitude of an aircraft under control of the pitch attitude channel of an automatic flight control system. This pitch wheel may also be used to command or adjust the aircraft vertical speed in the vertical speed mode of an automatic flight control system.

3,781,629

SYNCHRONOUS CONTROL SYSTEM ADAPTED FOR A NUMERICALLY CONTROLLED MACHINE

Yoshihiro Yashimoto, Tokyo; Hiroshi Usami, Kawasaki, and Toshiyoshi Okazaki, Tokyo, all of Japan, assignors to Fujitsu Limited, Kanagawa-ken, Japan

Filed July 7, 1972, Ser. No. 269,842

Claims priority, application Japan, July 7, 1971, 46/49585

Int. Cl. G05d *23/275*

U.S. Cl. 318—632 10 Claims

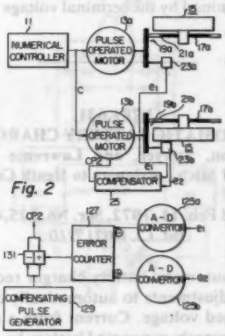


Fig. 2

Synchronous control system adapted for a numerically controlled machine having a gantry construction is arranged such that a movable part of the machine is given a feeding motion by a pair of feed systems driven by a pair of synchronously controlled pulse operated motors and detecting means separately detect manipulated feed quantities of said pair of feed systems provided for said movable part of the machine. As a function of the differential quantity of the manipulated feed quantities of both feed systems, a compensating means

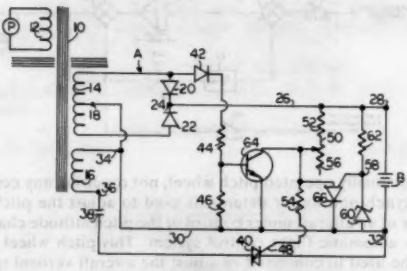
generates compensating pulses which are given to a selected one of the feed systems so that the differential quantity of the manipulated quantities becomes zero and both feed systems are synchronized with each other.

3,781,630

MEANS AND METHODS FOR FERRO-RESONANT FLOAT CHARGING CIRCUITS

Gray C. Ballman, 30 Portland Pl., St. Louis, Mo.

Filed July 10, 1972, Ser. No. 269,997
Int. Cl. H02j 7/04
U.S. Cl. 320—21 **9 Claims**



The invention comprises a circuit in which a ferro-resonant transformer is used to control operation of a battery charger in which the voltage supplied to the charging circuit by a first secondary winding in the transformer is regulated by a second independent winding in said transformer so long as current flows in said secondary winding, and in which the current flowing in the secondary winding is controlled by the means of a triac inserted in a second independent circuit which includes the secondary winding and which is operative by means of electronic switching devices contained in the charging circuit which are responsive to the charge status of the battery being charged as determined by the terminal voltage of said battery.

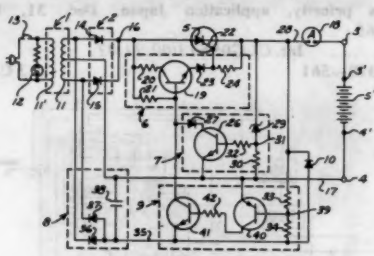
3,781,631

AUTOMATIC BATTERY CHARGER

Ronald C. Nelson, Sawyer, and Lawrence L. Grover, St. Joseph, both of Mich., assignors to Heath Company, Benton Harbor, Mich.

Filed Feb. 11, 1972, Ser. No. 225,457
Int. Cl. H02j 7/10
U.S. Cl. 320—25 **2 Claims**

A completely automatic battery charger requiring no internal or external adjustments to automatically charge a battery of a predetermined voltage. Current from a power supply is conducted to a properly connected battery by an SCR which is gated on during each proper polarity pulse of the cycle by a gate circuit. The gate circuit is rendered conducting only when a battery of the proper terminal voltage is properly connected to the terminals of the battery charger. Disabling circuits prevent the gate circuit from triggering the SCR under all adverse conditions including reverse connecting a battery to the charger terminals, short circuiting the charger terminals together, or connecting an undervoltage or overvoltage battery to the charger terminals. An overcharge protection circuit disables the SCR gate circuit when the battery terminal voltage reaches a predetermined value. The gate circuit is effective to gate the SCR either fully on or not provide any gate signal at all. Hence, strong pulses are provided to the battery whenever the charger is charging, and correspondingly, no polarization of the battery occurs even when the charger is left connected to the battery for weeks or months.

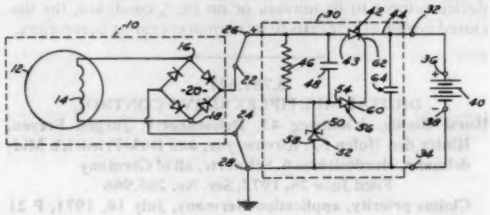


3,781,632

SERIES TYPE SOLID STATE VOLTAGE REGULATOR WHICH PROVIDES CONSTANT VOLTAGE TO A STORAGE DEVICE

Ben J. Charboneau, West Branch, Mich., assignor to Sno-Start, Inc., West Branch, Mich.

Continuation of Ser. No. 201,637, Nov. 24, 1971, abandoned.
This application Feb. 23, 1973, Ser. No. 335,164
Int. Cl. H02j 7/10
U.S. Cl. 320—39 **5 Claims**



A solid state voltage regulator electrically connected between a current source and a battery having a series SCR through which charging current is conducted whenever the battery voltage drops to a certain level. The current source supplies an unregulated pulsating DC output as an input to the regulator. The anode terminal of the SCR is connected to the positive terminal of the current source, the gate terminal of the SCR to a zener diode and the cathode terminal of the SCR to the positive battery terminal. The parallel combination of a resistor and a capacitor is connected from the positive terminal of the current source to the cathode terminal of the zener diode to provide a delay in the voltage rise at the cathode of the zener diode. When the battery voltage is sufficiently low to develop the necessary gate-cathode voltage for firing the SCR, gate current is drawn through the resistor and capacitor in sufficient amount to guarantee firing of the SCR. A diode is also connected between the gate terminal of the SCR and the cathode terminal of the zener diode to prevent reverse current flow from the battery through the cathode-gate circuit of the SCR to the zener diode. A capacitor may also be electrically connected across the regulator output to provide regulated DC power without a battery.

3,781,633

VEHICLE-CARRIED STORAGE BATTERY CHARGING DEVICE

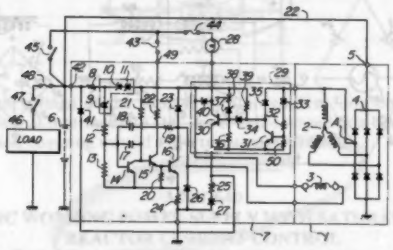
Katsutaro Iwaki, Chiryu; Kazumasa Mori, Kariya; Masaru Ishihama, and Yokio Kobayashi, both of Tokyo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed Sept. 14, 1971, Ser. No. 180,291

Claims priority, application Japan, Sept. 19, 1970, 45/93496; Sept. 19, 1970, 45/93497; Dec. 25, 1970, 45/135297

Int. Cl. H02j 7/14, 7/24

U.S. Cl. 320—48 3 Claims



A vehicle carried storage battery charging device has been provided which supplies D.C. electrical power through a rectifier circuit from an A.C. generator. A voltage regulator including a voltage detecting circuit controls the setting time of the generator in response to a voltage detecting circuit. A pilot lamp circuit receives a supply of current and is controlled by a first transistor which is in turn gated by a second transistor governed by the output of the generator. A second voltage detector circuit responsive to the battery voltage supplies the base current to the first transistor when the battery voltage exceeds a certain amount and a diode coupled between the first transistor and the lamp circuit supplies base current to the first transistor when the power source is disconnected from the battery, said base current through the first transistor causing same to become conductive to therby light up the pilot lamp circuit so as to indicate a malfunction.

3,781,634

INTEGRATED ERROR VOLTAGE REGULATOR FOR STATIC SWITCHING CIRCUITS

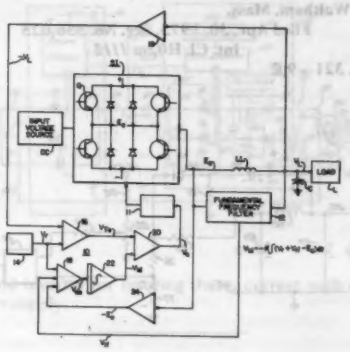
Ralph D. Jessee, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 18, 1971, Ser. No. 154,304

Int. Cl. H02m 1/12

U.S. Cl. 321—9 A 4 Claims

The invention pertains to a technique for controlling the switching instants of static switching devices comprising power inverter and converter circuits. The unfiltered voltage output of the power conversion circuit is compared to a constant amplitude A.C. reference voltage waveform to obtain a signal indicative of the instantaneous deviation of the output of the power conversion system from the constant amplitude AC waveform. This signal is then integrated and applied through suitable drive circuit means to control the switching instants of the static switching devices comprising the power conversion system. The switching instant control established by the integrated signal functions to control the switching instants so as to minimize the deviation of the power conversion system output voltage from the constant AC reference voltage. The switching instant control provided by the integrated



signal virtually eliminates low order harmonics present in the output voltage of the power conversion system.

3,781,635

CIRCUIT FOR CONVERTING DC VOLTAGE INTO THREE-PHASE VOLTAGE

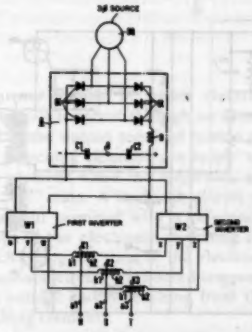
Helmut Sauer, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Jan. 18, 1972, Ser. No. 218,792

Claims priority, application Germany, Jan. 25, 1971, P 21 03 230.4

Int. Cl. H02m 1/12, 7/00

U.S. Cl. 321—9 R 1 Claim



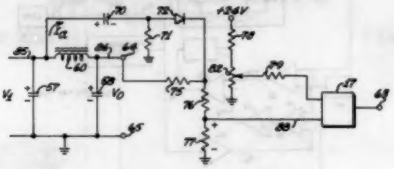
A circuit for converting DC voltage or a three-phase voltage of variable or constant frequency into a three-phase voltage of a constant other frequency utilizes an intermediate circuit frequency converter. The converter comprises two three-phase thyristor inverters, connected in parallel at the input side. The three-phase outputs of the one three-phase thyristor inverters are connected together via voltage divider chokes. The taps of the voltage divider chokes provide the three outputs of the converter.

3,781,636

LEAD NETWORK TO PREVENT VOLTAGE OVERSHOOT IN A SWITCHING REGULATOR

Luther L. Genuit, Scottsdale, and John R. Nowell, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 30, 1973, Ser. No. 356,025
Int. Cl. H02m 1/12
U.S. Cl. 321—9 R 4 Claims



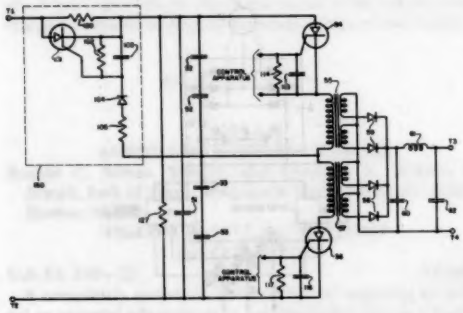
Voltage overshoot is prevented by coupling the voltage from the input lead of the filter circuit to an error amplifier. A capacitor, resistors and diode provide coupling while the voltage at the input lead of the filter circuit is increasing and prevent instability in the circuit. The voltage from the output lead of the filter circuit is also connected to the error amplifier to provide the normal control voltage.

3,781,637

INRUSH-CURRENT LIMITING DEVICE

Geoffrey Potter, Hopkinton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1973, Ser. No. 320,038
Int. Cl. H02m 1/18
U.S. Cl. 321—11 25 Claims



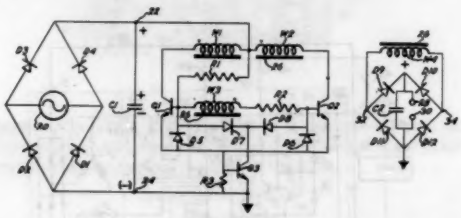
Apparatus, associated with an inverter circuit, for limiting inrush-current into a storage capacitor during an initial charging period, while minimizing the power dissipation of the limiting device during normal inverter operation. A resistive element provides a limiting device for the initial charging period of the storage capacitor. A silicon-controlled rectifier with associated apparatus, placed in a conducting state by the operation of the inverter circuit, provides an alternate low impedance path in parallel with the resistive element following the initial charging period.

3,781,638

POWER SUPPLY INCLUDING INVERTER HAVING MULTIPLE-WINDING TRANSFORMER AND CONTROL TRANSISTOR FOR CONTROLLING MAIN SWITCHING TRANSISTORS AND PROVIDING OVERCURRENT PROTECTION

Thomas E. Anderson, and John P. Walden, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 28, 1972, Ser. No. 267,262
Int. Cl. H02m 3/32
U.S. Cl. 321—14 9 Claims



A power supply includes a high frequency inverter comprising a pair of main switching transistors for alternately conducting current from a d.c. source through different winding halves of a multi-winding transformer. A starting resistor, connected between the source and the base of a selected one of the main transistors, initiates base-emitter current flow to make the transistor conductive. A control transistor turns the then conducting main transistor "off" in response to a predetermined current level through the conducting main transistor; the predetermined current level having been reached in response to the onset of magnetic saturation of the core of the transformer. Subsequently, a voltage induced in a third transformer winding initiates base-emitter current flow in the other main transistor thereby turning it "on". Also, the control transistor serves to turn either main switching transistor "off" when the current therethrough is excessive, (e.g., overload or short-circuit condition).

3,781,639

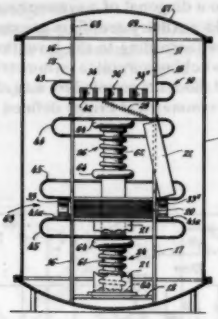
HIGH VOLTAGE ACCELERATOR POWER SUPPLY

Stanley G. Peschel, Brewster, N.Y., assignor to Hipotronics, Inc., Brewster, N.Y.

Filed Oct. 8, 1971, Ser. No. 187,688
Int. Cl. H02m 7/10; H01j ; H01f
U.S. Cl. 321—15 4 Claims

A high voltage accelerator power supply for providing a substantial current flow at a high D.C. voltage level including a step-up transformer mounted on an upright insulating frame at an intermediate level approximately midway between bottom and top of the power supply with the transformer being horizontally positioned and corona rings encircling the upper and lower edges of its core. One capacitor is below the level of the transformer core and another is above that level in a voltage-doubling arrangement while the core is electrically connected to a junction intermediate the two capacitors to be at an intermediate voltage level. A modular, flexible snake-like electrical device containing a plurality of series-connected rectifier cartridges positioned end-to-end, or similar components, enclosed within a plastic sheath enables connection with substantially uniform voltage stress distribution between a low voltage and a high voltage terminal by conveniently arranging the device in a helical or snake-like path. An isolation

transformer system includes first and second widely separated cores one at ground potential and the other at the high D.C.

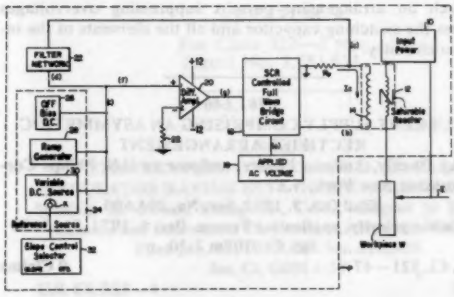


output voltage of the supply, with an endless loop coupling winding at intermediate D.C. level and encased in a heavy insulation covering wound a few turns on each core.

3,781,640
ARC WORKING POWER SUPPLY WITH SATURABLE REACTOR CURRENT CONTROL

Tibor Endre Toth, Florence, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,347
Int. Cl. H02m *1/08*
U.S. Cl. 321—18 3 Claims



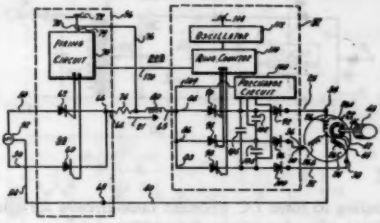
An arc working power supply wherein current is controlled by means of a saturable reactor and control circuit which monitors the current to the saturable reactor control winding comparing it to a reference for automatic adjustment. The control circuit includes a slope control for varying the rates of current rise and fall at the beginning and end of the operation.

3,781,641
ADJUSTABLE FREQUENCY POWER SUPPLY OF THE INVERTER TYPE

Charles E. Rettig, Brookfield, Wis., assignor to The Louis Allis Company, Milwaukee, Wis.

Division of Ser. No. 83,922, Oct. 26, 1970, abandoned. This application Jan. 8, 1973, Ser. No. 321,925
Int. Cl. H02m *7/00, 5/44*
U.S. Cl. 321—21 5 Claims

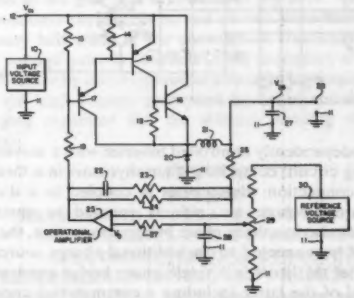
A power supply of the inverter type for controlling the operative condition of an alternating current load includes a power source, typically of the rectifier type, providing an output current. An inverter is connected to the power source and to the alternating current load for cyclically directing the output current of the power source to the load for controlling its operative condition. The power supply includes a means interconnecting, and coordinating, the operation of the power source and inverter for insuring that a current path exists in the power supply.



3,781,642
D.C.-D.C. POWER SUPPLY WITH STABILIZATION

David R. Dutton, North Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 6, 1972, Ser. No. 304,183
Int. Cl. H02m *7/52*
U.S. Cl. 321—43 11 Claims



A d.c.-d.c. power supply in which electric current is delivered to an output terminal through an inductance. Current is delivered to the output terminal from a power source when electronic switching elements are in an "on" state and through a diode element when the electronic switching elements are in an "off" state. A feedback circuit compares the voltage at the output terminal with a reference voltage to establish the state of the electronic switching elements. Immediately after changing the state of the electronic switching elements, the feedback circuit is rendered temporarily insensitive to transient voltage spikes resulting from the change of state of the switching elements.

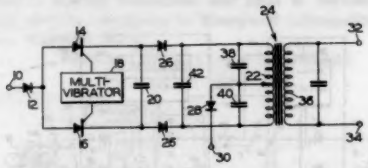
3,781,643
DC TO AC INVERTER

John F. King, 1882 Yolanda Ave., Springfield, Oreg.

Filed May 30, 1972, Ser. No. 257,822
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 C 4 Claims

In a static DC to AC inverter, one terminal of a source of direct current is connected through a pair of gate-controlled rectifiers to the opposite ends of a transformer primary winding the center tap of which is connected to the other terminal of the direct current source. Commutating capacitance is con-

nected across the gate-controlled rectifiers, and tank or oscillation capacitance is connected across the transformer primary winding to form LC resonant tank circuits for converting the direct current pulses to alternating current.

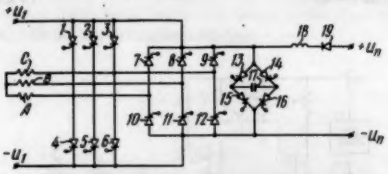


3,781,644

INDEPENDENTLY CONTROLLED INVERTER WITH UNIVERSAL COMMUTATING CIRCUIT

Vladimir Grigorievich Yatsuk, ulitsa Pervomaiskaya 8, kv. 57, Istra Moskovskoi oblasti, U.S.S.R.

Filed Mar. 23, 1973, Ser. No. 344,283
Int. Cl. H02m 7/52
U.S. Cl. 321—45 C **8 Claims**



An independently controlled inverter with a universal commutating circuit, comprising main thyristors in a three- phase bridge connection whose input is coupled to a d.c. supply source, and whose a.c. side is coupled to commutating thyristors also in a three-phase bridge connection, the d.c. side whereof is connected to an additional charge source and to additional thyristors in a single-phase bridge connection, the diagonal of the latter including a commutating capacitor, is characterized, according to the invention, by that the anode group of the additional thyristor single-phase bridge connection is coupled to the cathode group of the commutating thyristor three-phase bridge connection and, via a choke and a diode, to the positive terminal of the additional charge source, while the cathode group of said additional thyristor single-phase bridge connection is coupled to the anode group of said commutating thyristor three-phase bridge connection and to the negative terminal of the additional charge source.

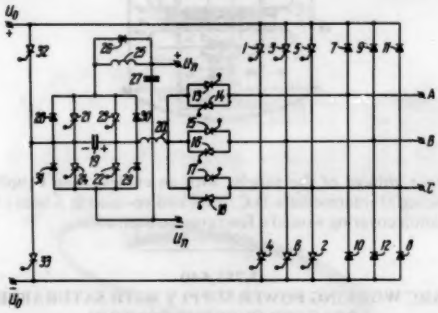
3,781,645

INVERTER

Jury Ivanovich Grom, ulitsa 9 Gvardeiskoi divizii 58, kv. 40, and Vladimir Grigorievich Yatsuk, ulitsa Pervomaiskaya 8, kv. 57, both of Moskovskoi oblasti, U.S.S.R.

Filed May 1, 1973, Ser. No. 356,196
Int. Cl. H02m 7/52
U.S. Cl. 321—45 C **3 Claims**

An inverter comprising main controlled rectifiers arranged in a 3-phase bridge configuration, shunted by reverse-conducting diodes and connected to a main D.C. source, a switching circuit comprising a switching capacitor and a switching choke coupled into a series string, auxiliary controlled rectifiers interconnected so that one end of said string is connected to three groups of said auxiliary rectifiers in mutual parallel opposition, each said group being coupled with one of the arms of the bridge built around the main controlled rectifiers, whereas the other end of said string is coupled to an arm of a bridge defined by other of said auxiliary rectifiers connected to the main D.C. source, and the switching capacitor is coupled into a diagonal of a symmetrical bridge defined by the rest of said auxiliary rectifiers connected to an additional D.C. source, according to the invention, characterized in that in the switching circuit a symmetrical bridge built around additional diodes is coupled by way of one diagonal to a diagonal of the symmetrical bridge defined by said auxiliary controlled rectifiers, which diagonal includes the switching capacitor, whereas an additional capacitor or a control pulse-generating unit is connected to the other diagonal of said bridge, the output of said control pulse-generating unit being connected with the switching choke circuit.



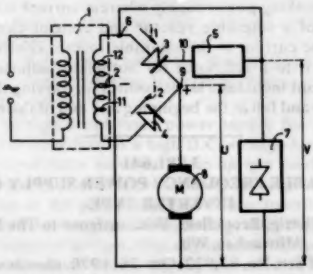
Such an arrangement permits suppressing overvoltages across the switching capacitor and all the elements of the inverter circuitry.

3,781,646

CURRENT SUPPLY COMPRISING AN ASYMMETRIC RECTIFIER ARRANGEMENT

Jacky Dheilly, Amiens, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1972, Ser. No. 294,680
Claims priority, application France, Dec. 6, 1971, 7143692
Int. Cl. H02m 7/20
U.S. Cl. 321—47 **9 Claims**



Full-wave rectified current supply comprising a single thyristor the gate electrode of which is connected to an electronic control circuit, which supply is connected to a direct-current motor. Varying the conduction angle of the thyristor enables torques of different values to be obtained in order to achieve regulation of the speed of the motor.

Applications: direct-current motors, washing machines, etc.

3,781,647

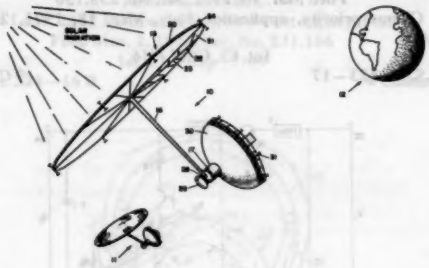
METHOD AND APPARATUS FOR CONVERTING SOLAR RADIATION TO ELECTRICAL POWER

Peter E. Glaser, Lexington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 838,896, July 3, 1969, abandoned. This application July 26, 1971, Ser. No. 165,893

Int. Cl. H02n

U.S. Cl. 322—2 19 Claims



Solar radiation is collected and converted to microwave energy by means maintained in outer space on a satellite system. The microwave energy is then transmitted to earth and converted to electrical power for distribution.

ERRATUM

For Class 322—8 see:
Patent No. 3,781,651

3,781,648

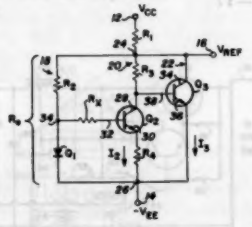
TEMPERATURE COMPENSATED VOLTAGE REGULATOR HAVING BETA COMPENSATING MEANS

William K. Owens, Sunnyvale, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 10, 1973, Ser. No. 322,329

Int. Cl. G05f *1/58*

U.S. Cl. 323—4 6 Claims



A temperature compensated voltage regulator circuit having a resistive impedance of a particular value disposed in the base circuit of the first of two cascaded transistor elements to provide compensation for possible beta (β) variations incurred as a result of process variables.

3,781,649

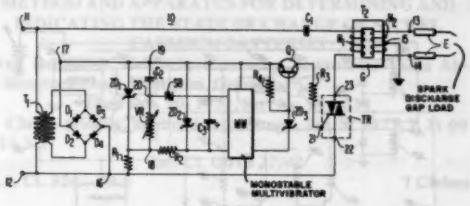
HIGH VOLTAGE PULSE GENERATING APPARATUS

Yoshio Ishida, Osaka, Japan, assignor to Diamond Electric Manufacturing Co. Ltd., Osaka, Japan

Filed July 31, 1972, Ser. No. 276,606

Int. Cl. G05f *3/04*

U.S. Cl. 323—19 1 Claim



A low level control voltage is produced by a first transformer connected to an alternating current power supply of commercial frequency through a rectifying device. A second transformer is connected through a capacitor and a bidirectional thyristor to the alternating current power supply. The high voltage pulse output of the second transformer is applied to the load such as fuel ignition spark gap, etc. When the control voltage from the first transformer periodically exceeds a predetermined voltage, a monostable-multivibrator is triggered, generating a pulse of a predetermined width. The pulse is applied to the base of a transistor having its collector connected to the gate of a bidirectional thyristor. Therefore, the bidirectional thyristor is turned on at a predetermined phase in every half cycle of the commercial frequency. A desired high voltage pulse is obtained at the secondary of the second transformer by the cooperative effects of a charging capacitor and the high voltage generated by series resonance of the charging capacitor and the primary winding of the transformer.

3,781,650

METHOD AND APPARATUS FOR REDUCING INTERFERENCE IN A SPIN RESONANCE SPECTROMETER BY SUBTRACTING INTERFEROGRAMS HAVING 180° PHASE SEPARATION

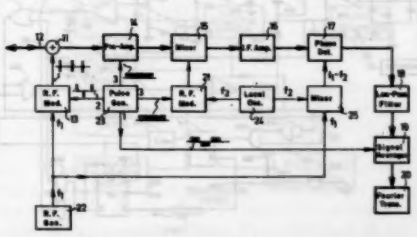
Toni Keller, Fallanden, Switzerland, assignor to Spectrospin A.G., Zurich-Fallanden, Switzerland

Filed May 9, 1972, Ser. No. 251,708

Claims priority, application Germany, May 28, 1971, P 21 26 743.6

Int. Cl. G01n *27/00*

U.S. Cl. 324—0.5 R 9 Claims

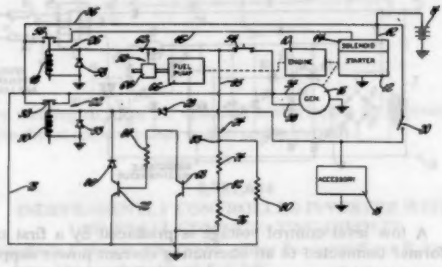


A method and apparatus are described for reducing interference in the receiver of a spin resonance spectrometer. The apparatus generates a first set of RF excitation pulses of one phase angle and a second set of RF pulses having a phase angle that is 180° different. The interferograms formed by one set of these pulses are then subtracted from those formed by the other in a signal averager.

3,781,651
PROTECTIVE CONTROL CIRCUIT FOR VEHICLE ELECTRICAL SYSTEMS

Rodney L. Heidel, Laporte, Ind., assignor to Meridian Industries, Inc., Southfield, Mich.

Filed Nov. 9, 1972, Ser. No. 305,198
Int. Cl. H02j 1/00
U.S. Cl. 322—8 13 Claims

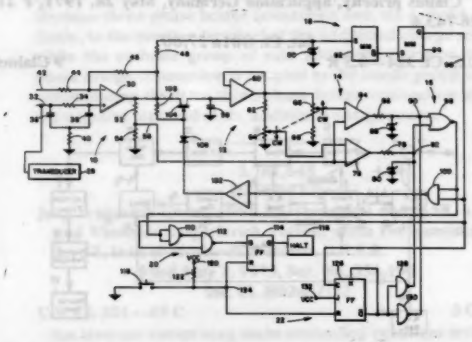


A protective control circuit is disclosed for vehicle electrical systems such as those used on trucks and military vehicles. Such electrical systems are provided with a reverse polarity relay for connecting the battery to the generator. When the accessory switch is closed to energize the reverse polarity relay a holding circuit is provided for the relay so that the battery remains connected with the generator even after the accessory switch is opened to shut down the engine. The continued connection of the battery with the generator serves to avoid transient overvoltages which would be damaging to electrical components connected in the system. When the engine and hence the generator stops spinning the battery is disconnected from the generator by disabling the holding circuit.

3,781,652
APPARATUS FOR ADAPTIVELY CHECKING DOCUMENT THICKNESS

George B. Weaver, Fridley, Minn., assignor to Honeywell Information Systems Inc., Waltham, Middlesex County, Mass.

Filed Dec. 20, 1971, Ser. No. 209,857
Int. Cl. G01n 27/00
U.S. Cl. 328—1 16 Claims

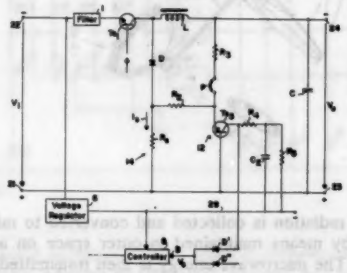


An apparatus for adaptively checking document thickness is provided, the apparatus having a transducer which senses a variation in the thickness of a document passing through a paper transport. Each new document thickness as indicated by the transducer is compared with a window established by the preceding document thickness. If the thickness of the current document meets prescribed limits as established by the preceding document, a memory element is updated to correspond to the thickness of the current document. Should the document thickness compare unfavorably with the window, an alarm signal is generated and the process halted without refreshing the memory element.

3,781,653
STABILIZED DIRECT-CURRENT CONVERTER RESPONSIVE TO OFF-PERIOD CURRENT

Roberto Marini, Milan, Italy, assignor to Societe Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Mar. 16, 1972, Ser. No. 235,150
Claims priority, application Italy, Mar. 18, 1971, 21945 A/71
Int. Cl. G05f 1/56
U.S. Cl. 323—17 9 Claims

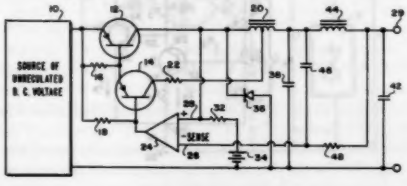


A stabilized d-c output is derived from a d-c input voltage through a stepdown circuit including a chopping transistor which is periodically blocked and unblocked by a pulse train from a trigger stage and, when conducting, charges a storage capacitor through a series inductance; with the chopping transistor cut off, the inductance continues the charging of the capacitor through a diode in series with a current sensor. The latter, together with a voltage sensor connected across the capacitor, controls the width of the pulses from the trigger stage to hold the voltage or current level substantially constant. An ancillary transistor is turned on by the trigger pulses to apply to the chopping transistor a reverse bias accelerating the sweep-out of its minority carriers.

3,781,654
SWITCHING VOLTAGE REGULATOR CIRCUIT

Kent W. Simcoe, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 26, 1972, Ser. No. 257,264
Int. Cl. G05f 1/56
U.S. Cl. 323—17 3 Claims



A tapped inductor is utilized in a switching mode voltage regulator, which employs a pass transistor and an associated driver transistor connected in a modified Darlington configuration, for the purpose of allowing these transistors to saturate during switching, thereby substantially increasing the over-all

efficiency of the regulator. A filter circuit may be added at the output of the voltage regulator to significantly reduce ripple and to improve the response of the regulator to load transients.

ERRATUM

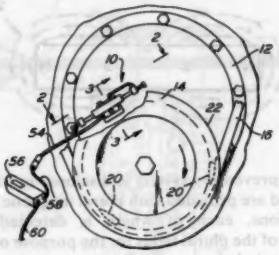
For Class 324—.5 R see:
Patent No. 3,781,650

3,781,655

TIMING DEVICE

Gerard Lane, 2512 Birchwood Dr., New Port Richey, Fla.

Filed Mar. 2, 1972, Ser. No. 231,166
Int. Cl. F02p *17/00*
U.S. Cl. 324—16 R **4 Claims**



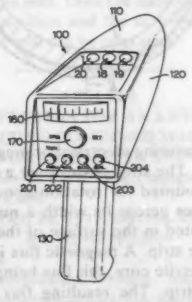
A timing device for use in connection with a fan belt pulley and a distributor in an automotive engine with the pulley being fitted with equally spaced contacts. The timing device includes a spring-loaded plunger, a pointer, and means to move the plunger and the pointer relative to a fixed plate having markings therein for the purpose of achieving an advance or retard position, the contacts of the pulley making mechanical and electrical contact with the spring-loaded plunger when said fan belt pulley rotates. The plunger is wired in a circuit to a spark plug wire on the distributor well with an indicator light being also in the circuit whereby the flashing of the light indicates that the timing of the engine is set in accordance with the pointer position.

3,781,656

STROBOSCOPE WITH VISUAL SPEED INDICATING SYSTEM EMPLOYING LIGHTS

Brian G. Glew, West Hill, Ontario, Canada, assignor to Carrier Technical Industries Ltd., Scarborough, Ontario, Canada

Filed May 21, 1973, Ser. No. 361,861
Int. Cl. F02p *17/00*
U.S. Cl. 324—16 R **8 Claims**



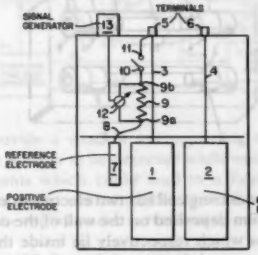
A stroboscope that may be used as a timing light is provided with a system for visually indicating to the user whether the engine being timed is running at, under or above the desired speed. The system includes three lights, one for indicating an on speed condition, the second an underspeed condition and the third an overspeed condition and a network for energizing an appropriate one of the lights depending upon and responsive to engine speed.

3,781,657

METHOD AND APPARATUS FOR DETERMINING AND INDICATING THE STATE OF CHARGE OF NICKEL CADMIUM BATTERIES

Welf Dennstedt, Kelkheim, Germany, assignor to Varta Aktiengesellschaft, Kelkheim, Germany

Filed Dec. 30, 1971, Ser. No. 214,030
Claims priority, application Germany, Jan. 2, 1971, P 21 00 011.3
Int. Cl. G01n *27/42*
U.S. Cl. 324—29.5 **7 Claims**



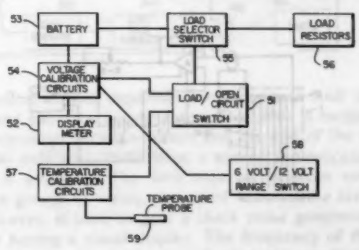
The invention proposes a method and apparatus for determining and indicating the state of charge of nickel-cadmium batteries. The method is based upon the degree of shift of the operating potential of the positive electrode in the negative direction when the electrode is under load. The shift in this potential is a measure of the extent of the discharge which has taken place and is thereby an indication of the state of charge.

3,781,658

METHOD AND APPARATUS FOR DETERMINING BATTERY PERFORMANCE AT ONE TEMPERATURE WHEN BATTERY IS AT ANOTHER TEMPERATURE

James B. Godshalk, Philadelphia, Pa., assignor to Fox Products Company, Philadelphia, Pa.

Filed Jan. 14, 1972, Ser. No. 217,760
Int. Cl. G01n *27/42*
U.S. Cl. 324—29.5 **17 Claims**



Both a method and apparatus are disclosed for testing lead-acid storage batteries to determine the cranking amperes which the battery can supply at a predetermined low temperature, typically 0°F., when the battery is in fact at a different temperature. The invention derives from the battery, after a short discharge at substantially its cranking ampere rating, an

electrical quantity representative of the actual terminal voltage of the battery at the end of the discharge, and converts this electrical quantity into an observable indication representing the terminal voltage which the battery would exhibit if similarly tested at the predetermined low temperature. The invention is based on the discovery that the terminal voltage of a lead-acid storage battery under load changes predictably with changes in temperature of the battery.

3,781,659

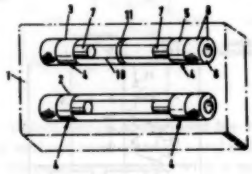
CONDUCTIVITY MEASURING SYSTEM AND CONDUCTIVITY CELLS THEREFOR

Amiram Ur, 79 North End House, Fitzjames Ave., London, England

Filed Nov. 9, 1970, Ser. No. 87,810

Int. Cl. G01n 27/42

U.S. Cl. 324—30 R **12 Claims**



An electrical measuring cell has two electrodes each formed by a conductive film deposited on the wall of the cell and having three portions which respectively lie inside the cell, outside the cell and around the rim of the cell. The second film portion enables the electrode to be connected to exterior circuitry and the third portion provides an electrical lead between the first and second film portions. The cells may be tubular or thimble shaped. Manufacture of the electrodes on the tubular cells is by dipping their ends into a metal compound solution and then treating the ends to plate the metal out of the solution. Apparatus employing this method utilises a turntable to carry the tubes and which is indexed between stations at which the different stages in electrode formation are carried out.

3,781,660

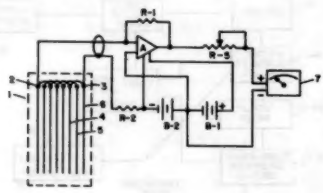
CONDUCTIVITY METER FOR MEASURING DISTILLATE HYDROCARBON FUELS

William C. Ludt, Yonkers, and Eugene H. Lombardi, Port Chester, both of N.Y., assignors to Ethyl Corporation, Richmond, Va.

Filed May 11, 1972, Ser. No. 252,473

Int. Cl. G01r 27/22, 27/24

U.S. Cl. 324—30 R **8 Claims**



Disclosed herein is a conductivity meter adapted for use in measuring the conductivity of distillate hydrocarbon fuels, comprising a conductivity probe, a direct current power source (e.g., nickel cadmium battery), an amplifier, and an ammeter calibrated in units of conductivity (e.g., picomhos per meter). The conductivity probe comprises two series of closely spaced plates of high surface area. The amplifier is of the high gain high input impedance (FET) operational type. The amplifier and battery are contained in a thermally insulated housing having a self-contained heating unit and heat sink.

3,781,661

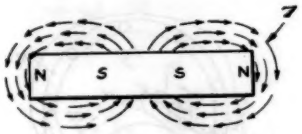
MAGNETIC MATERIAL AND METHOD OF PRODUCING SAME

Emmanuel M. Trikilis, 170 Maplewood Ave., Columbus, Ohio

Continuation of Ser. No. 733,163, May 29, 1968, abandoned, which is a division of Ser. No. 531,253, March 2, 1966, Pat. No. 3,418,613. This application Jan. 4, 1972, Ser. No. 215,385. The portion of the term of this patent subsequent to Dec. 13, 1983, has been disclaimed.

Int. Cl. G01r 33/00

U.S. Cl. 324—34 **10 Claims**



A pilferage prevention system is disclosed in which articles to be protected are provided with plural magnetic fields in different directions, each of which is detected such that neutralization of the plural fields for the purpose of preventing detection is precluded.

3,781,662

APPARATUS FOR DETERMINING THE PERMEABILITY OR STRESS IN A MOVING MAGNETIC STRIP IN TWO ORTHOGONAL DIRECTIONS

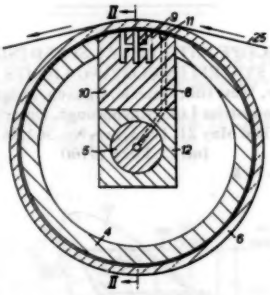
Norman Davis, London, England, assignor to The British Iron and Steel Research Association, London, England

Filed May 31, 1972, Ser. No. 258,340

Claims priority, application Great Britain, June 14, 1971, 27,820/71

Int. Cl. G01r 33/12

U.S. Cl. 324—34 ST **7 Claims**



A system for measuring electrical or magnetic properties of moving steel strip. The strip passes over a non-ferromagnetic sleeve which is mounted for rotation about a steel cylinder. The cylinder houses across its width a number of H-shaped ferrite cores mounted in the surface of the cylinder adjacent the pass line of the strip. A magnetic flux is induced between the arms of each ferrite core, this flux being influenced by the presence of the strip. The resulting flux is determined by search coils on the cores and gives a measure of the magnetic permeability of the strip at points across the width of the strip. The internal tensile stress in the steel strip which subsequently

determines the shape of the strip is related to the magnetic permeability, and hence it is possible to determine internal tensile stress distributions across the width of the strip which may give rise to bad shape.

3,781,663

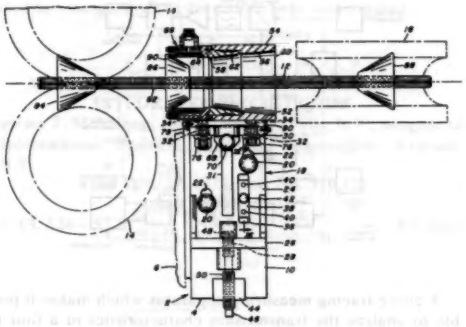
APPARATUS FOR ADJUSTABLY MOUNTING A TESTER TRANSDUCER RING AROUND THE PASS LINE OF A TUBULAR PRODUCT PROCESSING MILL

Eugene V. Abarotin, Franklin Twp., Westmoreland County, and Edward R. Bollinger, Jr., Delmont Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1973, Ser. No. 325,802

Int. Cl. G01r 33/12

U.S. Cl. 324—37 **6 Claims**



Apparatus includes a frame adapted to be affixed to the side of a tube rolling mill housing for supporting a vertically adjustable slide member having a horizontally adjustable support plate slidably mounted on its upper end. The support plate has a cylindrical guide mounted thereon which surrounds the pass line of the mill. The exit end of the guide is rigidly connected and aligned with the entry end of the tester transducer so that the two are moved together when either the slide member or the support member is moved. In use, to properly position the tester transducer, a screw shaft is passed through the guide and transducer and a first frusto conical plug is threaded along the shaft to a position adjacent the exit end of the transducer and second and third frusto conical plugs are threaded one on each end of the shaft between the forming rolls of the pairs adjacent opposite ends of the guide-transducer combination. The slide member and the support plate are then manipulated alternately until the center frusto conical plug fits in the exit end of the transducer and the other two plugs fit properly between the forming rolls of each pair. At this time the transducer will be properly positioned surrounding the centerline of the pass line of the mill. Then the slide member and support plate are fixed in position and the screw shaft and plugs are removed so that the mill can be operated.

3,781,664

MAGNETIC DETECTION FOR AN ANTI-SHOPLIFTING SYSTEM UTILIZING COMBINED MAGNETOMETER AND GRADIOMETER SIGNALS

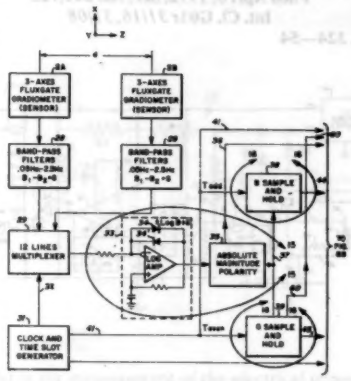
Louis H. Rorden, Menlo Park, Calif., assignor to Develco, Inc., Mountain View, Calif.

Filed Oct. 24, 1972, Ser. No. 299,695

Int. Cl. G01r 33/04

U.S. Cl. 324—43 R **23 Claims**

A magnetic surveillance system useful for detecting unauthorized removal of magnetically marked objects through a surveillance region includes at least one and preferably two three axis fluxgate type magnetometer-gradiometer sensors proximate the region to be monitored such as at an exit. Both the magnetometer and gradiometer signals are processed by appropriate algorithms to derive outputs proportional to the magnetic moment of and range to a magnetic anomaly within the region under surveillance. Minimum and maximum threshold values are prescribed for the detected magnetic moment to provide a window encompassing the magnetic moment of the marker to be detected while excluding other magnetic moments which could lead to a false alarm. A range threshold is set to exclude indication of magnetic moments outside of the region under surveillance.



3,781,665

CABLE FAULT LOCATION INDICATOR

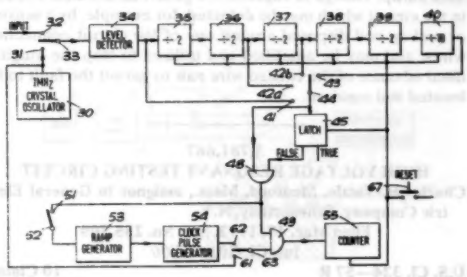
Philip Franklin Gale, Mold, Wales, assignor to The Electricity Council, London, England

Filed July 8, 1971, Ser. No. 160,754

Claims priority, application Great Britain, July 8, 1970, 33,239/70

Int. Cl. G01r 31/10

U.S. Cl. 324—52 **12 Claims**



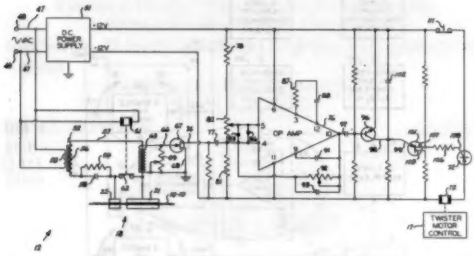
A method of, and apparatus for, locating a fault in an underground electrical power cable. The cable is excited to induce resonance between a fault and the end of the cable at which an indicator, comprising a sensor and processing circuitry, is attached. The time interval between successive waves or groups of waves, measured between the zero points of the waves, is used to gate a clock pulse generator into a counter having a visual display. The frequency of the clock pulse generator is arranged such that the reading on the counter is the distance from the indicator to the fault, expressed in metres, and the clock pulse generator is provided, with compensation for the frequency dependence of the velocity of propagation in the cable. Calibration of the indicator may be internal with respect to theoretical value for the velocity of propagation, or on-site, with respect to the actual velocity of propagation.

3,781,666

APPARATUS INCLUDING A PAIR OF DISSIMILAR SPACED ELECTRODES FOR DETECTING FAULTS IN INSULATED WIRES

Georg Christian Ernst Dornberger, Phoenix, Ariz., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Apr. 6, 1972, Ser. No. 241,723
Int. Cl. G01r 31/16, 31/08
U.S. Cl. 324—54 6 Claims



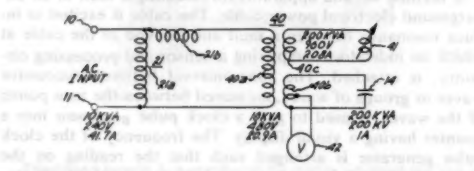
A twisted pair of insulated conductors is passed axially through a pair of longitudinally spaced, capacitive electrodes, each having a random distribution of conductive spheroids contained therein to center the wire within the electrodes, bring the electric field closer to the wires and obtain a uniform potential gradient therearound. The electrodes are tubular shaped, having equal diameters but unequal lengths and are held at a predetermined potential difference, for example, 2.5 kilovolts, by connecting them respectively to the opposite sides of a circuit arrangement including a high voltage transformer secondary winding in series with a resistor and a capacitor connected in parallel. During normal operation, the two electrodes, the wire insulation and the wires define a pair of parallel arms each consisting of two series-connected capacitors. As the twisted wire pair is passed through the electrodes, an insulation fault, for example, a bare wire, split insulation, void, short circuit between the wires, or runout of one or both wires, causes a breakdown of one or both capacitors. This abrupt change in capacitance generates a transient pulse in the circuit which may be detected, for example, by a sensing or pickup coil disposed around one of the circuit connecting wires, and may be amplified and utilized to stop the longitudinal advance of the twisted wire pair to permit the fault to be located and repaired.

3,781,667

HIGH VOLTAGE RESONANT TESTING CIRCUIT

Charles H. Tuttle, Medford, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,709
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R 10 Claims



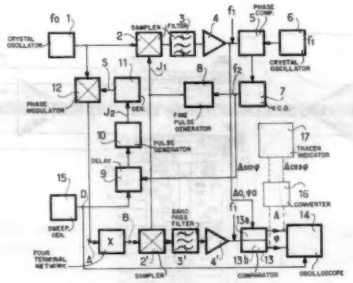
A transformer has two secondary windings, a high voltage secondary connected across a capacitive load being tested, and a low voltage secondary connected across a variable reactor which is tuned to resonance with the capacitive load. A voltage regulator in the transformer primary winding circuit is utilized to raise the voltage across the capacitive load to the test value after resonance has been achieved. The variable reactor can be replaced by a fixed reactor and a second voltage regulator.

3,781,668

PULSE-RESPONSE MEASURING APPARATUS

Charles Aillet, Lannion, France, assignor to Societe Lannionnaise D'Electronique, Lannion, France

Filed Apr. 19, 1972, Ser. No. 245,585
Claims priority, application France, Apr. 19, 1971, 7113775
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R 12 Claims



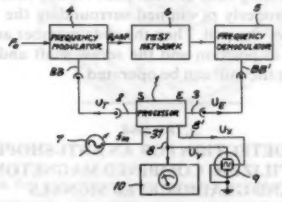
A curve-tracing measuring apparatus which makes it possible to analyze the transmission characteristics of a four terminal network which is excited by a high frequency wave modulated by a sequence of pulses wherein fine pulse samples at the output of the four terminal network are compared with samples taken of the modulated wave at the input of the four terminal network, whereby the time which passes between the beginning of the sequence of modulated pulses and the fine sampling pulses may be adjusted at will.

3,781,669

SYSTEM FOR MEASURING AMPLITUDE AND PHASE DISTORTION

Rudolf Dick, Eningen, Germany, assignor to Wandel u. Goltermann, Eningen, Germany

Filed Oct. 19, 1972, Ser. No. 298,829
Claims priority, application Germany, Oct. 19, 1971, P 21 51 981.3
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R 8 Claims



In order to measure nonlinear phase and/or amplitude distortions in the output of a test network serving for the transmission of FM signals, such as a directive radio link, a relatively low sweep frequency f_A of large amplitude U_A and a relatively high test frequency f_M of small amplitude U_M are jointly fed into the baseband input of a frequency modulator working into or forming part of the test network. For complete exploration of the transmission band $F_0 \pm \Delta F_s$ of the network (F_0

being a central carrier frequency) with different values of the test frequency f_M, without encroaching on adjoining bands, the peak amplitude U_A of the sweep voltage u_A is so chosen in dependence upon the test frequency that the frequency swing ΔF due to this peak amplitude satisfies the relationship $f_M + \Delta F = \Delta F_z$. To this end, a basic voltage u_z of sweep frequency f_A is fed into an attenuator whose step-down ratio k is electronically controlled through feedback to produce the peak amplitude U_A of sweep voltage $u_A = k \cdot u_z$ according to the formula

$$U_A = U_z \cdot (1 - f_M/\Delta F_z)$$

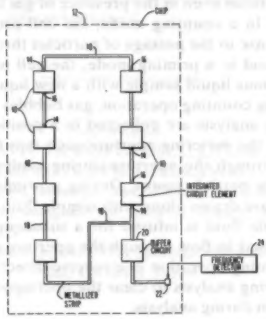
where U_z is the peak amplitude of the basic voltage u_z. Test frequency f_M may be derived, by means of a demodulator, from a source of higher frequency $f_M + f_z$ also working, at the opposite end of the test network, into a modulator receiving the demodulated network output to isolate from it a voltage of ancillary frequency f_z whose amplitude and phase are then detected as a measure of the distortions to be investigated.

3,781,670

AC PERFORMANCE TEST FOR LARGE SCALE INTEGRATED CIRCUIT CHIPS

Maurice T. McMahon, Jr., Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,122
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R **5 Claims**



After the circuit elements are formed in a large scale integrated circuit chip, but before the chip is personalized by a final metallization step in which the circuit elements are electrically interconnected in desired final circuit configuration, all of the circuit elements are temporarily interconnected in a recirculating test loop by a preliminary metallization step. Operating power is then applied to the circuit elements, and the frequency of the resultant self-oscillation of the loop is observed as an indication of the AC performance of the chip. If the chip passes the AC performance test, the temporary recirculating loop connections are interrupted, and the circuit elements are personalized by the final metallization step.

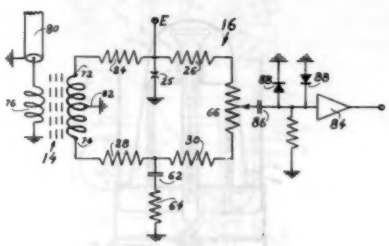
3,781,671

IMPEDANCE MEASURING BRIDGE CIRCUIT

Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash.

Filed Feb. 24, 1972, Ser. No. 229,133
Int. Cl. G01r 11/52, 27/26
U.S. Cl. 324—60 C **5 Claims**

Apparatus for measuring the electrical impedance of a variety of materials including an electrode arrangement providing sample data to an impedance bridge, a frequency generator providing a test signal to the impedance bridge, the impedance bridge including a transformer having three separate windings, two of which are highly symmetrical to each other and all three of which have an impedance below 10,000 ohms, and four resistors having resistance values differing from the impedance of the transformer windings but comparable to the unknown impedance, two of the four resistors connected to each of the two symmetrical windings of the transformer. Output devices for displaying the electrical impedance are also disclosed. In one embodiment, a sample box useful in the measurement of the electrical impedance of bulk materials including novel means for mounting an electrode therein is disclosed. Also disclosed in another embodiment is apparatus useful for measuring the electrical impedance of thin sheet material including novel mechanical thermal compensation means.

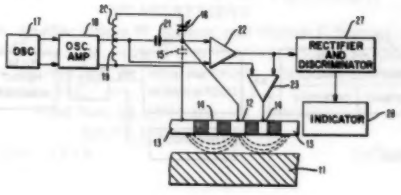


3,781,672

CONTINUOUS CONDITION MEASURING SYSTEM

Frederick L. Maltby, Jenkintown, and Jonathan Kramer, Devon, both of Pa., assignors to Drexelbrook Controls, Inc., Glenside, Pa.

Filed May 10, 1971, Ser. No. 141,839
Int. Cl. G01n 27/22; G01f 23/26; G01g 11/04
U.S. Cl. 324—61 R **11 Claims**

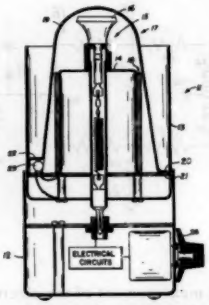


In a system which continuously measures the composition, position or size of materials, the probe has a guard shield which is effective for continuous measurement. The measurement system includes a zero adjusting impedance connected with the variable probe impedance as two adjacent arms of a balanceable bridge. A span impedance is connected between the junction of the adjacent arms and a low impedance AC source. The buffer amplifier has its input connected across the span impedance so that changes in the input impedance of the amplifier do not change the operating point of the system. A guard shield amplifier has its input connected to the output of the buffer amplifier. The guard shield amplifier maintains the guard shield at the same potential as the voltage on the probe electrode continuously for all points of operation, without significantly changing the voltage.

3,781,673
PACKING ADAPTER FOR TESTING MOIST CHOPPED MATERIALS IN A GRAIN MOISTURE TESTER

Roy E. Resh, Bettendorf, Iowa, assignor to Agridustrial Electronics, Inc., Bettendorf, Iowa

Filed Mar. 24, 1972, Ser. No. 237,663
Int. Cl. G01r 27/26
U.S. Cl. 324—61 R 5 Claims

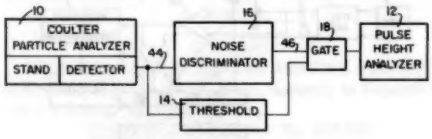


An insulating, frustum-shaped adapter is disposed around the inner cylindrical electrode of a grain moisture tester to provide a desirable, repetitive amount of packing of moist, chopped material and to provide during the testing of moist material with high dielectric constant, capacitance within the range obtained while testing grain.

3,781,674
NOISE DISCRIMINATING CIRCUITRY AND METHOD FOR ELECTRONIC PARTICLE STUDY APPARATUS

William A. Claps, Dade, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed July 22, 1971, Ser. No. 165,276
Int. Cl. G01n 27/08
U.S. Cl. 324—71 CP 17 Claims

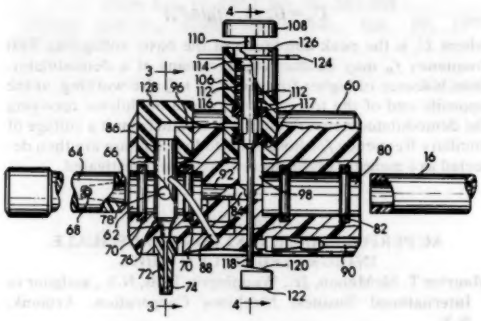


By discriminating against signal rise time, i.e., the duration of the leading edge of a signal, noise signals can be excluded from data transmisson wherein the data pulses normally have slower rise times, even though both noise and data pulses exceed low threshold settings. When the subject discrimination is employed in the environment of a Coulter particle analyzing apparatus, the minimum rise time of data pulses derived from monitored particles is a known value; therefore, all signals having faster rise time can be discriminated against. The discriminator can comprise a source of clock pulses and a simple binary counter by use of which the rise time of each signal is compared with a preset time or count value. All signals having a rise time greater than the preset value causes the discriminator to enable an output gate which passes the original signal to subsequent processing and analyzing circuits for particle analysis.

3,781,675
SELF-PRIMING CONDUCTIVITY CELL

Henry R. Angel, Trumbull, Conn., assignor to General Science Corp., Bridgeport, Conn.

Filed Apr. 27, 1972, Ser. No. 247,991
Int. Cl. G01n 27/00
U.S. Cl. 324—71 CP 18 Claims

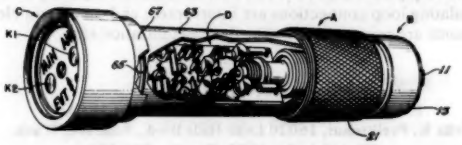


A conductivity cell for use in a system for counting particles suspended in a liquid and operative to reliably and accurately count such particles even in the presence of gas bubbles in the liquid sample. In a counting mode, the cell provides output pulses in response to the passage of particles through a metering aperture, and in a priming mode, the cell is operative to replace a previous liquid sample with a new liquid sample for analysis. During counting operation, gas bubbles which can be present during analysis are collected in a position physically removed from the metering aperture such that these bubbles cannot flow through the aperture during analysis to erroneously affect the particle count. During a priming operation, these bubbles are drawn along with sample fluid from the cell and new sample fluid is infused for a subsequent analytical run. Air is caused to flow through the aperture during a portion of the priming operation in a reverse direction to that of liquid flow during analysis to clear the aperture of any debris which may form during analysis.

3,781,676
CONTACT STRUCTURE FOR TEST PROBE

Robert A. Williams, Fort Worth, Tex., assignor to Williams Instruments, Inc., Fort Worth, Tex.

Division of Ser. No. 85,693, Oct. 30, 1970. This application July 7, 1971, Ser. No. 160,450
Int. Cl. G01r 1/06; H01r 13/62
U.S. Cl. 324—72.5 9 Claims



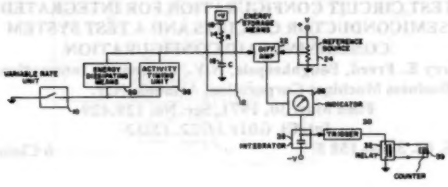
The specification discloses a test probe having a pair of concentric electrical contact means resiliently mounted at the end region of the body of the probe. The outer contact means is formed in part from a plurality of telescopic bellows, a plurality of which are supported to telescope beyond a forward wall structure. The other of the contact means forms an inner contact and extends through the outer contact.

3,781,677

VARIABLE RATE MEASURING DEVICE

Thomas E. Hagen, Saugerties, N.Y., assignor to Frederick S. Zipser, M.D., Red Hook, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,973
Int. Cl. G01r 23/02; G04f 9/00
U.S. Cl. 324—78 R 11 Claims



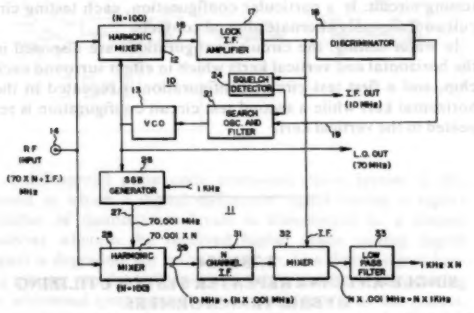
A variable rate measuring device is provided for accurately measuring the rate in which a series of input signals are provided. The device operates by means of an energy storage RC network which is repeatedly discharged by means of a constant current source energized by the variable rate signal. The net storage level is detected at an input of a differential amplifier, compared with the reference signal, and the difference indicated on a meter. Means are also provided for accumulating the varying rate signal over a period of time for providing a totalized count indicative thereof.

3,781,678

AUTOMATIC TRANSFER OSCILLATOR WITH IMPROVED FM TOLERANCE

Richard E. Voyles, Moraga, and William A. Giles, Concord, both of Calif., assignors to Systron Donner Corporation, Concord, Calif.

Filed Feb. 14, 1973, Ser. No. 332,354
Int. Cl. G01r 23/14
U.S. Cl. 324—79 D 5 Claims



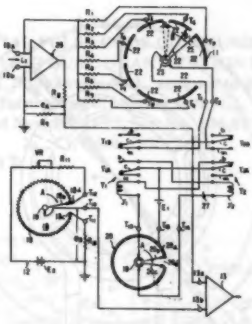
An automatic transfer oscillator for counting a radio frequency input signal with improved FM tolerance includes a frequency locked loop in combination with a circuit for deriving the harmonic number of the frequency locked loop. A counting circuit counts both the local oscillator and intermediate frequency of the frequency locked loop concurrently over a common time period to provide the final RF count.

3,781,679

LOGARITHMIC RECORDING SYSTEM

Takao Matsumoto, 60 Kuritaya, Kanagawa-ku, Yokohama, Japan

Filed Feb. 5, 1973, Ser. No. 329,445
Int. Cl. G01r 13/04, 15/10, 15/08
U.S. Cl. 324—115 3 Claims



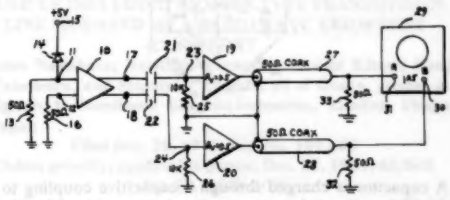
A range switching circuit is comprised of a DC amplifier to which is supplied an electric signal to be recorded, a plurality of resistances corresponding to respective digit places within an entire recording range, and a range switching device for selectively connecting the resistances to a feedback path to the DC amplifier. A logarithmic characteristic generating circuit includes a logarithmic potentiometer to produce an output in accordance with the change in the level of the input signal. The outputs from the range switching circuit and the logarithmic characteristic generating circuit are delivered to a comparison circuit, which then produces an output corresponding to the difference therebetween. A servomotor responsive to the output from the comparison circuit drives the aforesaid range switching device and logarithmic potentiometer. A rotary switch is also driven by the servomotor to actuate a relay circuit for controlling the operation of the range switching device, which operates a writing mechanism to record the electric signal.

3,781,680

DIFFERENTIAL METHOD OF PHOTOCURRENT MEASUREMENT

Robert A. Stehlin; Hilton W. Spence, and Walter T. Matzen, all of Richardson, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 16, 1971, Ser. No. 199,211
Int. Cl. G01r 1/30, 31/26
U.S. Cl. 324—123 R 2 Claims



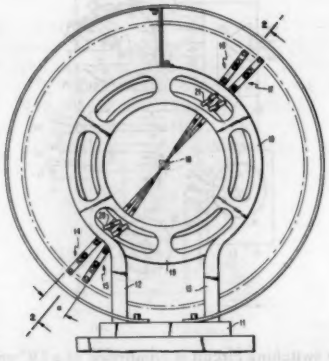
A differential amplifier circuit for measuring radiation induced photocurrents in small geometry semiconductor devices.

3,781,681

TEST PROBE APPARATUS

John W. Wagner, Hopewell Junction, and Paul M. Young, Pleasant Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1971, Ser. No. 209,236
Int. Cl. G01r 31/02
U.S. Cl. 324—158 P 7 Claims



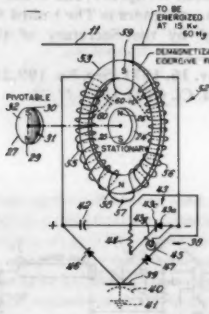
An array of test probes individually mounted to a test fixture is provided for contacting a substantially increased number of pads on high density circuit chips. The probes are mounted in side by side relationship in groups with each group of probes making contact with respective pads that are proximately positioned and, preferably, on the same radial line of a chip. Each probe has a contact blade carried by parallel springs of minimum gram load to assure uniform force deflection contact ratios and each blade-spring arrangement acts as the electrical conducting circuit for that probe of the array.

3,781,682

RESETTABLE FAULT INDICATING MEANS HAVING A RINGLIKE MAGNETIC CIRCUIT

Edmund O. Schweitzer, Jr., Northbrook, Ill., assignor to E. O. Schweitzer Manufacturing Co., Inc., Mundelein, Ill.

Division of Ser. No. 119,639, March 1, 1971, Pat. No. 3,702,966. This application Sept. 18, 1972, Ser. No. 290,215
Int. Cl. G01r 19/16, 31/02
U.S. Cl. 324—133 6 Claims



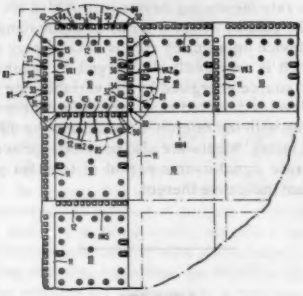
A capacitor is charged through a capacitive coupling to a high voltage alternating current electric power conductor and is discharged when the charge reaches a predetermined value to reset a fault indicator that previously had been operated by flow of fault current in the conductor. The magnetic circuit employs a demagnetizable low coercive force core in the form of a bifurcated yoke or a ring having magnetizing windings energized on discharge of the capacitor. A manually resettable fault indicator employing a demagnetizing winding on a low coercive force ring also is disclosed.

3,781,683

TEST CIRCUIT CONFIGURATION FOR INTEGRATED SEMICONDUCTOR CIRCUITS AND A TEST SYSTEM CONTAINING SAID CONFIGURATION

Larry E. Freed, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1971, Ser. No. 129,429
Int. Cl. G01r 31/22, 15/12
U.S. Cl. 324—158 F 6 Claims



A test circuit configuration for a monolithic integrated semiconductor circuit structure containing a plurality of substantially aligned test contact with which a corresponding plurality of contactors in a testing apparatus head are engaged to provide the input/output points required for the test. The contacts are connected to testing circuits containing active and passive devices in the monolithic semiconductor structure in such a manner that no two adjacent contacts are in the same testing circuit. In a particular configuration, each testing circuit contains only alternate aligned contacts.

In wafer testing, the circuit configurations are disposed in the horizontal and vertical kerfs which in effect surround each chip, and a first test circuit configuration is repeated in the horizontal kerf while a second test circuit configuration is repeated in the vertical kerf.

3,781,684

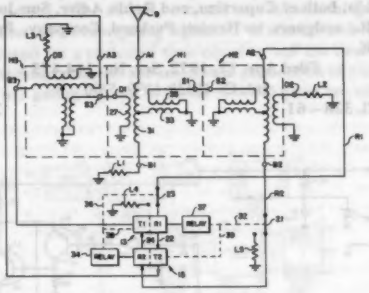
SINGLE-ANTENNA REPEATER SYSTEM UTILIZING HYBRID TRANSFORMERS

Hans E. Inslerman, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 24, 1970, Ser. No. 22,298
Int. Cl. H04b 7/14
U.S. Cl. 325—5 3 Claims

One embodiment of this repeater comprises a multicoupler comprising three hybrid transformers for coupling a pair of transceivers to a single antenna, which may be simultaneously used without interference for transmitting and receiving of dif-

ferent frequencies, to relay signals between stations which would otherwise be out of range of each other. A pair of the



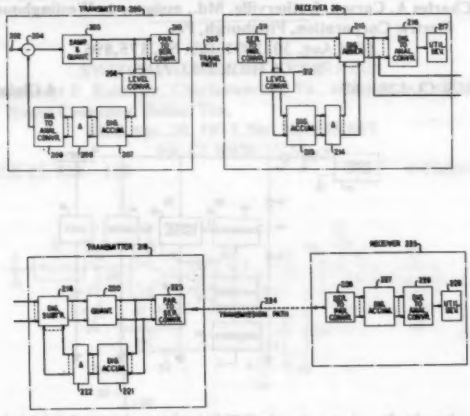
multicouplers may be interconnected with another hybrid transformer to couple four transceivers to a single antenna.

3,781,685

DIFFERENTIAL PULSE CODE COMMUNICATIONS SYSTEM HAVING DUAL QUANTIZATION SCHEMES

Yau Chau Ching, Morganville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1972, Ser. No. 306,018
Int. Cl. H04b 1/00, 7/00
U.S. Cl. 325—38 B 8 Claims



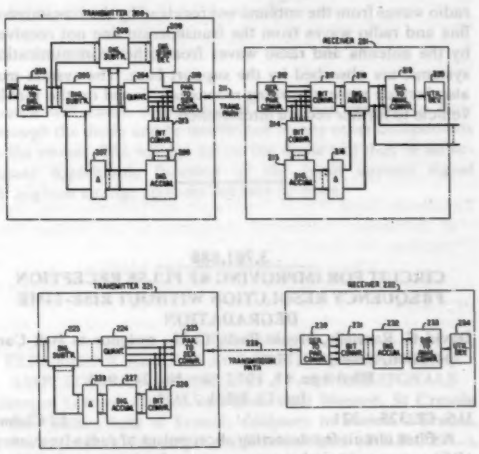
A differential pulse code communications system is disclosed in which a digital difference signal having a higher number of quantization levels is transmitted to a distant receiver wherein the received higher grade quality digital signal is degraded, for re-transmission, to a digital signal having a lesser number of quantization levels without introducing an additional quantization error component into the system. In the transmitter, the transmitted higher grade quality difference signals are degraded to the lower grade quality digital signals before being digitally accumulated for subtraction from the input signal. At the receiver, the higher grade quality transmitted difference signals are similarly degraded to the lower grade quality digital signals and digitally accumulated. The higher grade quality reconstruction of the input signal is obtained by summing the received higher grade quality difference signal plus the accumulated lower grade quality digital signals. The lower grade quality digital difference signal derived from the higher grade quality digital signal may be re-transmitted to another distant location with a quantization error equivalent to the error introduced by quantizing the input signal to a difference signal having the fewer number of quantization levels.

3,781,686

DIFFERENTIAL PULSE CODE COMMUNICATIONS SYSTEM HAVING DUAL QUANTIZATION SCHEMES

Yau Chau Ching, Morganville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1972, Ser. No. 306,019
Int. Cl. H04b 1/00, 7/00
U.S. Cl. 325—38 B 9 Claims



A differential pulse code communications system is disclosed wherein the transmitter quantizes differential signals on two quantizing scales having different numbers of levels. The combined signal is transmitted to a receiver which may either utilize the higher quality signal or re-transmit either the lower and/or higher quality signal, without re-quantization and the error associated therewith, to yet another receiver; the quality of the signal re-transmitted being determined by the bandwidth of the re-transmission channel.

3,781,687

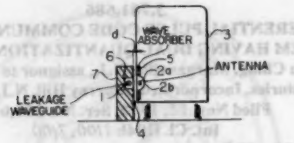
WIRELESS COMMUNICATION SYSTEM FOR RAILWAY VEHICLE INCLUDING AN OPEN TYPE TRANSMISSION LINE MOUNTED ON A RADIOWAVE ABSORBENT SUPPORT

Tsuneo Nakahara; Noritaka Kurauchi; Hiroshi Kitani; Kenji Takemura, and Masataka Kuroda, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Limited, Osaka, Japan

Filed Dec. 28, 1970, Ser. No. 101,669
Claims priority, application Japan, Dec. 28, 1969, 45/845
Int. Cl. H04b 1/10
U.S. Cl. 325—52 6 Claims

A communication system for eliminating interference in communications between a fixed station and a mobile vehicle. The fixed station includes a support base for supporting an open type transmission line, along the path of the mobile vehicle. The transmission line transmits radio waves from the fixed

station and receives radio waves from the mobile vehicle. The mobile vehicle includes an antenna positioned to transmit radio waves from said mobile vehicle and to receive radio waves from the fixed station. The support base is positioned relative to the transmission line and the antenna, such that



radio waves from the antenna not received by the transmission line and radio waves from the transmission line not received by the antenna and radio waves from other communication systems, are absorbed by the support base. The system may also include wave absorbing means positioned on the mobile vehicle to further reduce interference.

3,781,688

CIRCUIT FOR IMPROVING RF PULSE RECEPTION FREQUENCY RESOLUTION WITHOUT RISE-TIME DEGRADATION

David C. Rannells, Menlo Park, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 11, 1972, Ser. No. 242,960
Int. Cl. H03k *13/02*
U.S. Cl. 325—321 **13 Claims**

A filter circuit for detecting short pulses of radio frequency (RF) energy centered at a given center frequency and within a given narrow bandpass region. Received pulses of RF energy are upconverted in a frequency multiplier circuit to achieve resultant pulses at the same repetition rate and pulse width as the received pulses but having frequency spectrum components centered at a new center frequency of *n* times the given center frequency of the received pulses. These frequency spectrum components have the same absolute frequency and amplitude relationship to their new center frequency as the frequency spectrum components of the received pulses had to their given center frequency. The resultant pulses are then passed through a bandpass filter circuit having its bandpass region centered at the new center frequency and having a bandpass region wider than the width of the given narrow bandpass region. A detector circuit detects the passage of resultant pulses through the bandpass filter circuit. The multiplication of the received pulses by a factor of n allows the use of a bandpass filter circuit having a wider width than the given narrow bandpass region. This wider width bandpass filter allows the detection of relatively short pulses of RF energy.

ERRATUM

For Class 328—1 see:
Patent No. 3,781,652

ERRATUM

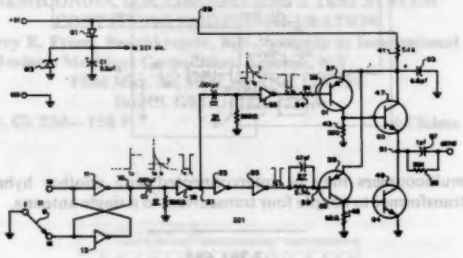
For Class 324—65 R see:
Patent No. 3,781,911

3,781,689

TRISTATE PULSE GENERATOR FOR PRODUCING CONSECUTIVE PAIR OF PULSES

Howard D. Marshall, Santa Clara; Gary B. Gordon; Jesse E. Pipkin, both of Cupertino, and Robin Adler, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 17, 1972, Ser. No. 244,475
Int. Cl. H03k *1/00, 5/00*
U.S. Cl. 328—61 **2 Claims**



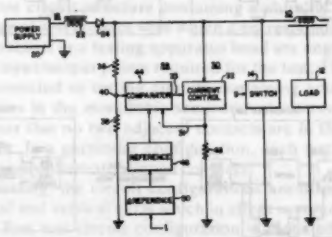
An improved manually-triggerable pulse generator has a high-impedance output in one operating state and alternate high-and-low-level logic states of low output impedance in remaining operating states for operation as a source of test pulses in digital circuitry.

3,781,690

IMPROVED PFN VOLTAGE REGULATOR

Charles A. Corson, Lutherville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 30, 1971, Ser. No. 175,896
Int. Cl. H03k *1/02, 1/12*
U.S. Cl. 328—67 **6 Claims**



A pulse forming network (PFN) is charged to an initial voltage level above a desired operating level. The PFN is then slowly discharged by a controlled discharge path first to an intermeidate voltage level and thereafter, beginning at a set time before the main discharge into a load, it is further discharged to the desired operating level.

3,781,691

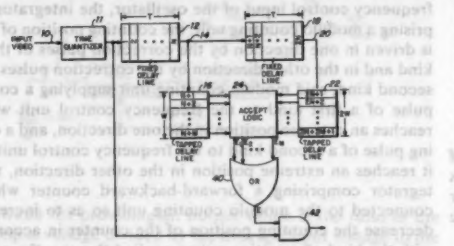
PULSE REPETITION FREQUENCY FILTER CIRCUIT

Weldon W. Bauman, Sunnyvale, and Edward Collins, IV, San Jose, both of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed May 1, 1972, Ser. No. 248,909
Int. Cl. H03k *5/20*
U.S. Cl. 328—109 **20 Claims**

A pulse repetition frequency (PRF) filter circuit wherein the pulse repetition interval (PRI) between previously received pulses is utilized to gate a currently received pulse. In one embodiment the PRI between first and second received

pulses of a pulse train is utilized to gate a third and currently received pulse in that pulse train. The first pulse, after being delayed for a period of time equal to twice the pulse repetition time (PRT) of a pulse train having one highest PRF within the bandpass of the filter circuit, enables the sequential generation of a first series of n gating signals. The second pulse, after being delayed for a period of time equal to half the time delay of the first pulse, enables the sequential generation of a second series of $n/2$ gating signals. A series of AND gates are enabled



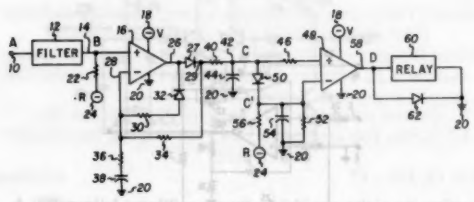
in sequence by the first and second series of gating signals, with each AND gate in the series being enabled in sequence by one gating signal of the second series of gating signals and any one of three gating signals of the first series of gating signals. The circuit is designed such that the simultaneous enabling of an AND gate by a gating signal from the first series and a gating signal from the second series defines the PRI between the first and second received pulses. This defined PRI is then utilized to generate a narrow gating window for a third pulse in the pulse train at the determined PRI after the second pulse.

3,781,692

SWITCHING CIRCUIT APPARATUS

Raymond P. Escoffier, Charlottesville, Va., assignor to Collins Radio Company, Dallas, Tex.

Filed Apr. 30, 1973, Ser. No. 355,603
Int. Cl. H03k *5/153*
U.S. Cl. 328—138 **4 Claims**



A circuit for detecting a burst of single frequency waveforms of a precise time duration from an input providing a wide frequency range of signals and providing an output of that time duration. A slope polarity detecting switch of simple design lies at the heart of the circuit.

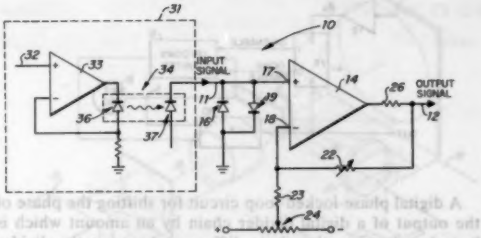
3,781,693

LOGARITHMIC AMPLIFICATION CIRCUIT

Peter W. Ford, Winchester, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 29, 1972, Ser. No. 239,177
Int. Cl. H03k *17/03*; G06g *7/24*
U.S. Cl. 328—145 **10 Claims**

A circuit for generating an output signal that is a logarithmic function of an applied input signal. The circuit comprises an input signal source exhibiting the properties of an ideal constant current source, an amplifier coupled to said source, and a diode or other logarithmic element coupled across the source and between the source and the amplifier. The circuit is designed such that the amplifier will present a substantially infinite impedance to the diode and this property coupled with the substantially infinite impedance of the



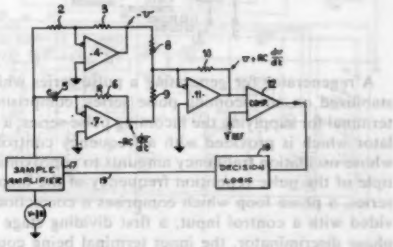
source will cause essentially all the input current to flow through the diode and be unaffected by any other components in the circuit. The voltage across the diode will thus be an accurate logarithmic function of the input current signal throughout a range up to six decades or more.

3,781,694

ELECTRONIC CIRCUIT FOR PREDETERMINING THE AMPLITUDE OF SAMPLES OF ANALOGUE SIGNALS

Georges Lefevre, Nantes, and Jean Paul Menard, St Crespin Sur Moine, both of France, assignors to Societe d'Etudes, Recherches et Constructions Electroniques (S.E.R.C.E.L.), Carquefou, France

Filed Oct. 28, 1971, Ser. No. 193,287
Claims priority, application France, Nov. 6, 1970, 7040039
Int. Cl. H03k *5/20*
U.S. Cl. 328—150 **3 Claims**



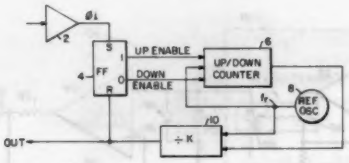
An electronic circuit has a transfer function of $1 + \tau p$, p being the Laplace variable, and τ a time constant at least equal to the time which separates a characteristic instant of the logical treatment of the samples from the instant of their being stored. This circuit is inserted upstream of the logical processing circuits, and downstream of the point where the samples are taken with a view to being stored.

The circuit has utility with sample amplifiers having automatic gain regulation.

3,781,695
DIGITAL PHASE-LOCKED-LOOP

Edward J. Jackson, Boulder, Colo., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 4, 1972, Ser. No. 250,128
Int. Cl. H03b 3/04
U.S. Cl. 328—155 8 Claims

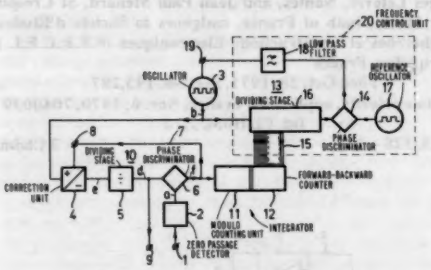


A digital phase-locked-loop circuit for shifting the phase of the output of a digital divider chain by an amount which is linearly related to the phase difference between the divider output and some other received signal having substantially the same frequency.

3,781,696
REGENERATOR FOR GENERATING A PULSE SERIES WHICH IS TO BE STABILIZED ON AN INCOMING IMPULSE SERIES

Lambertus Jacob Willem Van Loon, and Dirk Muilwijk, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1972, Ser. No. 283,215
Claims priority, application Netherlands, Aug. 28, 1971, 7111888
Int. Cl. H03k 5/00
U.S. Cl. 328—164 2 Claims

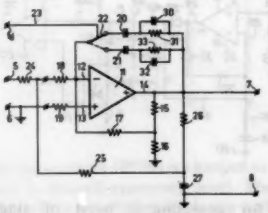


A regenerator for generating a pulse series which is to be stabilized on an incoming pulse series, comprising an input terminal for supplying the incoming pulse series, a pulse oscillator which is provided with a frequency control input and whose oscillation frequency amounts to approximately a multiple of the pulse repetition frequency of the incoming pulse series, a phase loop which comprises a correction unit, provided with a control input, a first dividing stage and a first phase discriminator, the input terminal being coupled, via a zero-passage detector, to a first input of the first phase discriminator so as to apply a control signal to this input, the oscillator being coupled, via the correction unit and the first dividing stage, to a second input of the first phase discriminator so as to supply a comparison signal to this input, an output of the first phase discriminator being coupled to the control input of the correction unit so as to apply to the control input, at the instants of occurrence of the control signal and in accordance with the sign of a phase difference existing between the control signal and a comparison signal, a correction pulse of a first or a second kind, respectively, under the control of which a pulse is suppressed or is added, respectively, to the pulse series originating from the oscillator, an integrator being connected to the output of the first phase discriminator, said integrator being coupled, via a frequency control unit, to the frequency control input of the oscillator, the frequency control unit comprising a second phase loop which is provided with a second phase discriminator, a second dividing stage with an adjustable dividend being connected between the oscillator and a first input of the second phase discriminator, a reference oscillator being connected to a second input of the phase discriminator, a low-pass filter being connected between the output of the second phase discriminator and the frequency control input of the oscillator, the integrator comprising a modulo counting unit, the counting position of which is driven in one direction by the correction pulses of the first kind and in the other direction by the correction pulses of the second kind, said modulo counting unit supplying a counting pulse of a first kind to the frequency control unit when it reaches an extreme position in the one direction, and a counting pulse of a second kind to the frequency control unit when it reaches an extreme position in the other direction, the integrator comprising a forward-backward counter which is connected to the modulo counting unit so as to increase or decrease the counting position of the counter in accordance with the kind of counting pulses applied thereto, the counter being connected to the second counting stage so as to adjust the dividend of the second dividing stage in accordance with the counting position of the counter.

3,781,697
FILTER FOR USE IN A CARRIER-WAVE MEASURING SYSTEM

Berend Theodorus Jan Bruinshorst, and Theodorus Jozef Van Kessel, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1972, Ser. No. 249,539
Claims priority, application Netherlands, May 13, 1971, 7106554
Int. Cl. H03k 5/00
U.S. Cl. 328—167 5 Claims



For servo systems and measuring systems which use a carrier wave for the measuring information an accurately adjustable bandwidth around the carrier frequency is obtainable by connecting switches synchronous with the carrier wave together with filter networks in the negative-feedback loop of an operational amplifier.

This enables small carrier measuring voltages to be amplified with a given bandwidth.

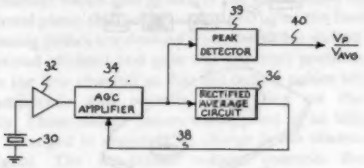
By providing an additional low-frequency negative-feedback loop across the filter the filter can be made insensitive to direct voltages and low frequencies with respect to the frequency band around the carrier wave.

3,781,698

VOLTAGE RATIO DISCRIMINATOR

Richard K. Davis, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed May 30, 1972, Ser. No. 257,917
Int. Cl. H03d 1/20
U.S. Cl. 329—178 7 Claims



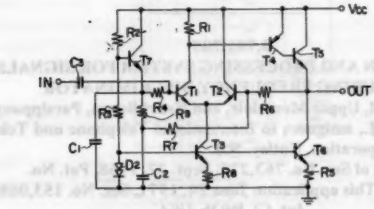
A circuit for providing an output which is the ratio of the peak input voltage divided by the average input voltage to the circuit. This circuit includes means to first provide for generating both the peak input and the rectified average or background input which provides an output which serves as a means to control the overall operation of the initial averaging means. There is further provided means to distinguish a peak value from the first mentioned average to provide the output specified.

3,781,699

DIFFERENTIAL AMPLIFIER CIRCUIT

Yoshio Sakamoto, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 27, 1972, Ser. No. 292,785
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 4 Claims



A differential amplifier circuit which comprises an emitter follower transistor adapted to operate at the same time the power supply is turned on, the output of said transistor being fed to the first input of the differential amplifier and servicing to charge a capacitor connected to the second input of said differential amplifier, whereby the rise of the output signal is made quick and the so-called pop signal normally produced in the amplifier is eliminated.

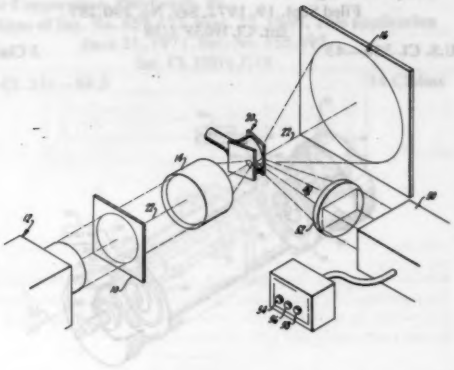
3,781,700

OPTICAL ELEMENT SYSTEM AND METHOD FOR AMPLIFYING IMAGE FORMING LIGHT RAYS

Theodor W. Hansch, and Frank L. Varsanyi, both of Palo Alto, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Feb. 11, 1971, Ser. No. 114,470
Int. Cl. H01s 3/10
U.S. Cl. 330—4.3 17 Claims

An optical element system and method for amplifying light rays such that a typical plane in object space can be transferred and amplified as an image on a screen and image space using an organic dye media disposed in the path of the amplifying rays and excited by light pulses of having predetermined characteristics. Uses suggest themselves in widely varying field of infrared, ultraviolet and visible optical instruments and computers and other devices.

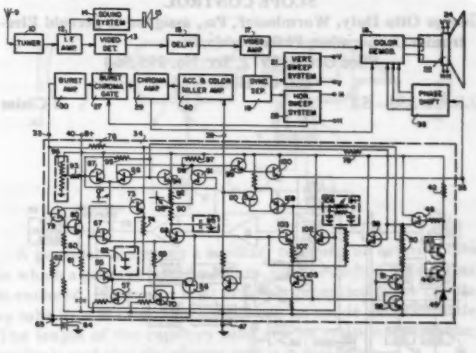


3,781,701

SIGNAL PROCESSING CIRCUIT FOR A COLOR TELEVISION RECEIVER

Gildo Cecchin, Niles, and Francis H. Hilbert, River Grove, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Division of Ser. No. 880,320, Nov. 26, 1969, Pat. No. 3,604,845. This application Mar. 4, 1971, Ser. No. 120,927
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 3 Claims



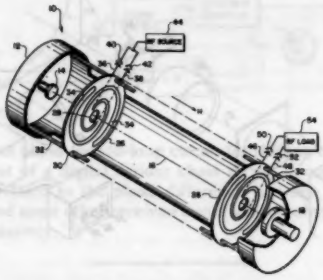
A color television receiver uses an integrated circuit to provide the subcarrier reference signals and ACC control voltage for the receiver. The circuit includes a first differential amplifier, unbalanced at the burst signal frequency, operated as the color reference oscillator to provide first and second differently phased output signals which are applied to a pair of differential steering gates. A phase-shift hue control of the color reference signal is obtained by adding selected outputs of the pair of differential steering gates. In addition, a differential amplifier is operated as a diodeless detector for deriving an ACC voltage from the oscillator output when burst signals are applied to the input of the oscillator.

3,781,702

TWT WITH STACKED SPIRAL-PAIRS SLOW-WAVE CIRCUIT

Louis J. Jasper, Jr., Neptune City, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 19, 1972, Ser. No. 290,287
Int. Cl. H03F 3/58
U.S. Cl. 330—43 3 Claims



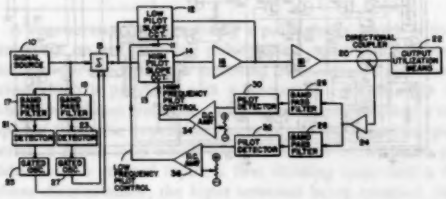
A traveling wave amplifier having a slow-wave circuit in the form of a stack of thin, flat elements with identical spiral pairs radiating from a common axis, the inner ends of the spirals of each pair being 180° apart and equidistant from the axis, and each element having a perforation for an electron beam between the inner end of its two spirals. RF that is coupled into the spirals of the element at one end of the stack is propagated by the spirals and radiated element-to-element and extracts energy from the electron beam. The RF, amplified, is taken from the spirals of the element at the other end of the stack.

3,781,703

ELECTRONIC AMPLIFIER WITH DUAL AUTOMATIC SLOPE CONTROL

George Otto Duty, Warminster, Pa., assignor to Jerrold Electronics Corporation, Philadelphia, Pa.

Filed Oct. 6, 1972, Ser. No. 295,564
Int. Cl. H03g 5/16
U.S. Cl. 330—52 1 Claim



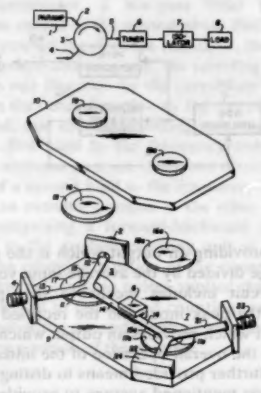
An amplifier is characterized by electronically variable slopes ("tilt") at the bounds of its signal amplification gain-frequency passband characteristic. Separate feedback circuitry is responsive to an associated one of two frequency-spaced pilot signals for suitably adjusting the response properties of the amplifier. The pilot signals may be specially generated, or may comprise components of the signal operated upon by the amplifier - such as one high band and one low band video carrier for a CATV television signal distribution application.

3,781,704

HIGH ISOLATION CIRCULATOR ARRANGEMENT FOR LOW NOISE REFLECTION TYPE AMPLIFIERS

Johannes Albertus De Gruyl, Commack, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 30, 1972, Ser. No. 239,653
Int. Cl. H03f 3/60
U.S. Cl. 330—53 3 Claims



A multi-junction cascade circulator includes an interjunction tuning device to enable operation of a reflection type amplifier with only one pass of input isolation, thereby minimizing degradation of signal to noise ratio due to input circuit losses while maintaining high isolation between the input and output of the amplifier independent of the load conditions.

ERRATUM

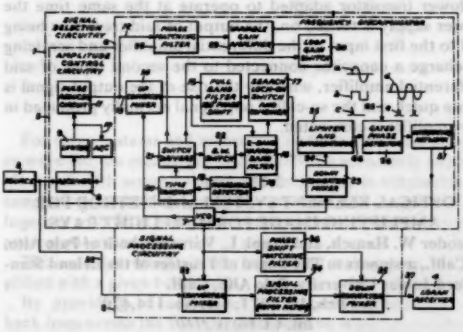
For Class 330—51 see:
Patent No. 3,781,912

3,781,705

SELECTION AND PROCESSING SYSTEM FOR SIGNALS INCLUDING FREQUENCY DISCRIMINATOR

Milton Dishal, Upper Montclair, and Henri Baran, Parsippany, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 763,225, Sept. 27, 1968, Pat. No. 3,732,500. This application June 14, 1971, Ser. No. 153,088
Int. Cl. H03b 3/04
U.S. Cl. 331—17 4 Claims



A signal selection and processing system for use with a broadband LORAN receiver in which the average of the

strongest interfering signal having a predetermined duty cycle sets the AGC level and, via a special frequency discriminator, controls the frequency of a voltage controlled oscillator (V-CO). The VCO output is used to shift the entire band of input frequencies so that said strongest signals fall into the attenuating notch of a notch filter while passing the other signals to the LORAN receiver.

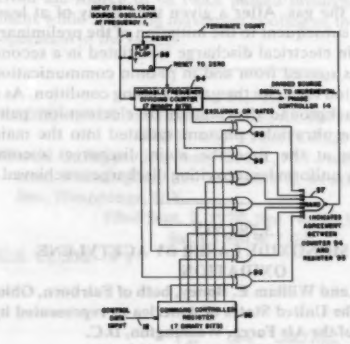
In said discriminator, signals are transmitted through one channel in which a certain phase shift is produced and a second channel which also produces the same phase shift plus an additional phase shift which varies 180° over the band of interest. Gating pulses are derived from the phase shifted signals in the second channel and gate out different portions of the signals in the first channel so that the output pulses are of different amplitude and polarity, depending on the input frequency. These output pulses are applied to an integrating network arranged to maintain its charge in the absence of an input signal. The integrated voltage controls the VCO frequency. Frequency search and lock-on are accomplished by switching broadband and narrow band phase shifting filters and varying the gain in the first channel to maintain stability. Up-and-down frequency conversions in said second channel are effected by said VCO. In another embodiment a single frequency conversion for both channels is employed.

3,781,706

INCREMENTAL PHASE SHIFT FREQUENCY SYNTHESIZER

Eugene F. Osborne, Westminster, and Terrence L. McGovern, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1972, Ser. No. 277,968
Int. Cl. H03b *27/00*
U.S. Cl. 331—45 **8 Claims**



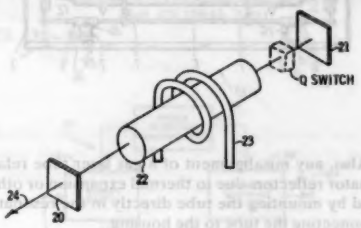
Apparatus for synthesizing an adjusted reference signal at a frequency that is controllable to a prescribed value performs the programmed addition (or subtraction) of sequential incrementation of phase shift to the reference signal output of an undisturbed oscillator that has a characteristic frequency of oscillation that is accurately predictable for a significant time period into the future. Purposes of the proposed apparatus include (a) the generation and maintaining of small offsets in the frequency of the adjusted output reference signal relative to the nominal or actual frequency of the oscillator, (b) the compensation for the time dependent predictable drift of the source oscillator to maintain the adjusted output signal at the desired frequency even though the source oscillator frequency changes, (c) the operation of precise time and frequency systems with complete coherency between the modulation representing timing and the RF carrier representing frequency, and (d) the ability to calibrate, adjust, and normalize the timing of a clock system operating from the adjusted reference signal both as to location of its epoch(s) and its scale relative to an accepted system primary standard of time.

3,781,707

CALCIUM CONTAINING SILICATE OXYAPATITE LASERS

Richard H. Hopkins; George W. Roland, both of Monroeville; Kenneth B. Steinbruegge, Murrysville, and William D. Partlow, Blackridge, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 859,673, Sept. 22, 1969. This application June 21, 1971, Ser. No. 155,097
Int. Cl. H01s *3/16*
U.S. Cl. 331—94.5 **14 Claims**



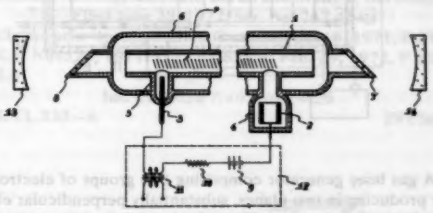
A composition of matter which can be used as a laser crystal in a laser generator and which can be doped with sensitizer ions has the empirical chemical formula $CaM_{1-x}(SiO_4)_3O:A_x$ where A represents a lasing ion selected from Nd, Er, and Ho, x has a value from 0.001 to 1 and M represents an ion selected from La, Gd and mixtures thereof.

3,781,708

D.C. DISCHARGE GAS LASER WITH NOVEL DISCHARGE TUBE

Noboru Henmi, 2-3, Midori-machi, and Hiromi Kumagai, 3-4-6 Nishikubo, both of Musashino-shi, Tokyo, Japan

Filed Aug. 25, 1971, Ser. No. 174,604
Claims priority, application Japan, Sept. 5, 1970, 45-78032
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **4 Claims**



A gas laser comprises a capillary tube and an external tube in which a gaseous lasing medium, such as carbon dioxide gas, is enclosed. Plasma for laser action is generated in the capillary tube by a D.C. discharge between an anode and a cathode. The length of the capillary tube and its relation to the electrodes is such that the plasma area is in said tube.

3,781,709

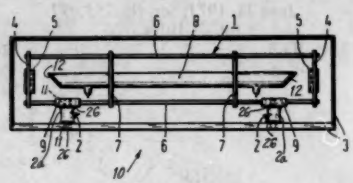
LASER ARRANGEMENT

Otmar Hintringer, Neubiberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 68,179, Aug. 31, 1970, abandoned. This application Aug. 2, 1972, Ser. No. 277,161
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **5 Claims**

A laser arrangement, and particularly a gas laser, has resonator means contained in a housing or enclosure and mounted therein by yieldable, vibration-dampening means in

a manner to mechanically isolate the resonator with respect to the housing so that shifting or expansion of the housing during a warm-up period will not disturb or effect the dimensioning or spacing of reflectors forming a portion of the resonator



means. Also, any misalignment of a gas laser tube relative to the resonator reflectors due to thermal expansion or otherwise is avoided by mounting the tube directly in the resonator and by not connecting the tube to the housing.

3,781,710

GAS LASER GENERATOR DEVICES

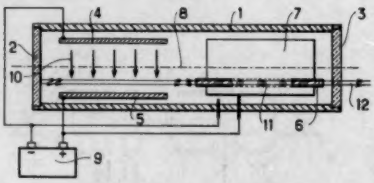
Guy Boudinet, Vitry, and Jean Rocca-Serra, Paris, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Sept. 22, 1972, Ser. No. 291,513

Claims priority, application France, Sept. 24, 1971, 7134404

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 **2 Claims**



A gas laser generator comprising two groups of electrodes for producing in two planes, substantially perpendicular electric discharges, the gain of each discharge being chosen so that the laser phenomenon takes place only on the intersecting straight line of the two discharge planes.

3,781,711

LASER DYE COMPOSITION

Karl H. Drexhage, and George A. Reynolds, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1972, Ser. No. 298,057

Int. Cl. H01s *3/20*

U.S. Cl. 331—94.5 **8 Claims**

This invention relates to the use of rigidized di- and tripehnyl methane dyes, as well as the aza derivatives thereof as lasing media in liquid dye lasers. Lasing media containing certain of these dyes have advantageously been found to lase in the red and near infrared region of the electromagnetic spectrum.

3,781,712

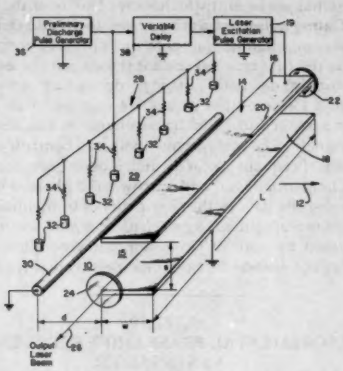
GAS LASER WITH DISCHARGE CONDITIONING USING ULTRAVIOLET PHOTONS GENERATED IN HIGH CURRENT DENSITY PRELIMINARY DISCHARGE

O'Dean P. Judd, Los Alamos, N. Mex., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 17, 1972, Ser. No. 298,218

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 **12 Claims**



Discharge excited gas laser arrangements are disclosed wherein a preliminary electrical discharge having a current density of at least about one ampere per cm^2 is established in a first region of the laser gas. This discharge produces a large number of ultraviolet photons which propagate through the gas and collide with neutral gas molecules to produce electronion pairs in the gas. After a given time delay of at least about one μsec. subsequent to the initiation of the preliminary discharge, a main electrical discharge is initiated in a second region of the gas spaced from and in photon communication with the first region to excite the gas to a lasing condition. As a result of the background distribution of electron-ion pairs generated by the ultraviolet photons radiated into the main discharge region at the time the main discharge is commenced, a highly uniform laser exciting discharge is achieved.

3,781,713

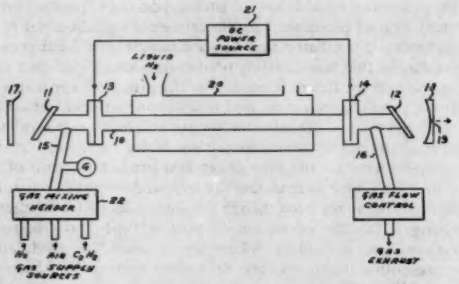
CARBON MONOXIDE LASER BY ACETYLENE OXIDATION

James D. Barry, and William E. Boney, both of Fairborn, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 7, 1972, Ser. No. 304,586

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 **6 Claims**



A direct current discharge gas laser charged with a mixture of helium-air-acetylene, through the chemical interaction in-

duced by the dc discharge providing CO, results in a more efficient carbon monoxide laser with laser emission on the P-branch vibrational-rotational transitions from v=3:2 to v=11:10 with J nominally from 11 to 14. The wavelength of laser emissions extend to below 5.0 microns.

3,781,714

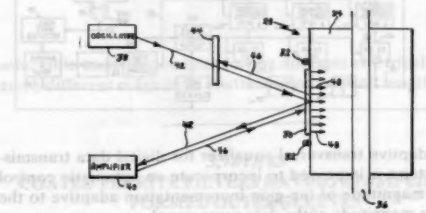
ISOLATOR FOR HIGH POWER LASER SYSTEM

Howard Schlossberg, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 155,567, June 22, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,510

Int. Cl. H01s 3/02

U.S. Cl. 331—94.5 5 Claims



A high power laser system having a radiation source and an amplifier with an isolator located in such a position as to reflect radiation from said source to said amplifier. This isolator is made up of an isolator element in intimate contact with a reflector-heat sink and surrounded by a magnetic field. The arrangement of the isolator enables the radiation emanating from the source to be twice passed through the isolator element while affording maximum cooling of the element during operation of the system.

3,781,715

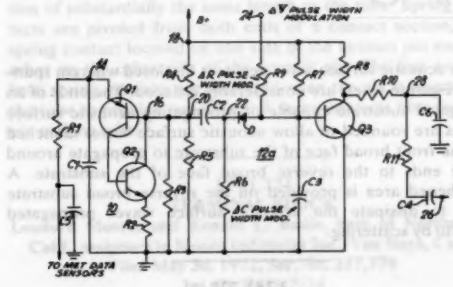
RADIOSONDE METEOROLOGICAL DATA OSCILLATOR AND PULSE STRETCHER

Martin C. Poppe, Jr., Stony Brook, N.Y., and Maurice Friedman, Philadelphia, Pa., assignors to Beukers Laboratories, Inc., Hauppauge, N.Y.

Filed Sept. 2, 1970, Ser. No. 68,990

Int. Cl. H03k 7/08

U.S. Cl. 332—9 T 8 Claims



A meteorological data signal generator comprises a variable frequency pulse oscillator having an output rate proportional to the level of a sensed meteorological parameter, e.g. temperature. A pulse stretcher is coupled to the output of the pulse oscillator to expand the pulse and lower the high frequency harmonic content of the output pulses. The extent of pulse stretching is variable, and if desired, may be controlled by a second sensed meteorological parameter, whereby a single output pulse train is modulated in response to two distinct parameters.

3,781,716

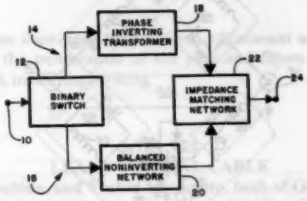
BIPHASE RADIO-FREQUENCY MODULATOR

Thomas E. Gerst, Albuquerque, and John G. Webb, Jr., Sandia Park, both of N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Oct. 27, 1972, Ser. No. 301,410

Int. Cl. H03k 7/00

U.S. Cl. 332—9 R 6 Claims



A biphase radio-frequency modulator which includes a pair of electrically balanced circuit branches, one branch having a phase inverting transmission line transformer with the other branch having a noninverting transmission line transformer connected therein, together with means for selectively directing radio-frequency signals in one or the other of the branches and means for coupling the inverted or noninverted signals from the branches to an output terminal.

3,781,717

PIEZOELECTRIC FILTER HAVING RESONATORS FORMED BETWEEN ADJACENT INTERFERENCE LOCATIONS

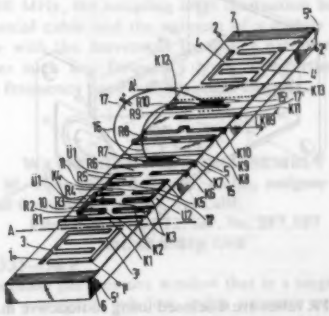
Friedrich Kuenemund, Muenchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 29, 1972, Ser. No. 267,424

Claims priority, application Germany, July 6, 1971, P 21 33 634.5; Nov. 26, 1971, P 21 58 858.9; Feb. 29, 1972, P 22 09 585.8

Int. Cl. H03h 7/46, 7/04, 9/26

U.S. Cl. 333—6 29 Claims



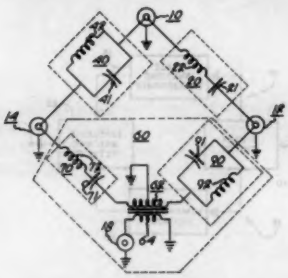
An electromechanical device operating on the surface-wave principle as a transducer of a filter comprises a substrate carrying a plurality of electrodes. The substrate may include a piezoelectric material and have interference locations defin-

ing resonant circuits. The interference locations may include a broken line of laser produced spots, a protuberance or a groove extending perpendicular to the direction of wave propagation.

3,781,718
HYBRID BAND PASS-BAND STOP FILTER

Norman C. Gittinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,358
Int. Cl. H03h 7/04, 7/14
U.S. Cl. 333—11 **15 Claims**

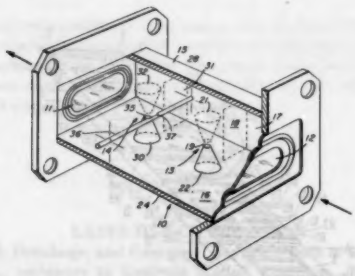


A hybrid filter having the characteristics of a hybrid coupler and band pass and band stop filters combined. The hybrid filter provides a band pass port and a band stop port to which a number of frequency filters are connected. A predetermined frequency range of a spectrum of frequencies applied to the hybrid filter is isolated and confined to the band pass port. The frequencies other than the band pass frequency range are transmitted to the band stop port. The hybrid filter provides a constant impedance at all frequencies by employing reactive elements of critical values. A high attenuation exists at all frequencies between the band pass and band stop ports.

3,781,719
PASSIVE TR TUBES

Earle Frederick Durkee, Danvers, Mass., assignor to Microwave Associates Inc., Burlington, Mass.

Filed Sept. 1, 1971, Ser. No. 176,982
Int. Cl. H01p 1/14
U.S. Cl. 333—13 **10 Claims**

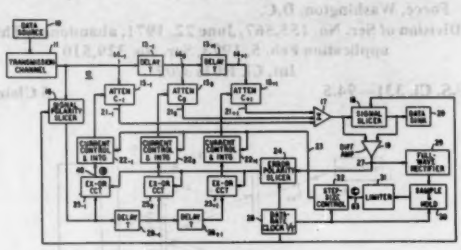


Passive TR tubes are disclosed using radioactive material to supply free electrons in the output cone-gap. The radioactive material is so located that it will not be damaged by the RF discharge in the gap, and can be included in the fabrication after the final brazing. Moreover, the electrical RF characteristics of the TR cell are maintained substantially or entirely without perturbation.

3,781,720
AUTOMATIC TAP-GAIN INCREMENTATION OF ADAPTIVE EQUALIZERS

Kurt Hugo Mueller, Kuesnacht, Switzerland, assignor to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.

Filed Jan. 4, 1973, Ser. No. 320,881
Int. Cl. H04b 3/04
U.S. Cl. 333—18 **6 Claims**

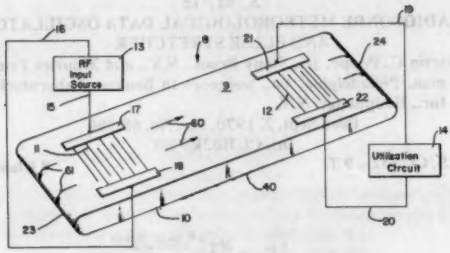


An adaptive transversal equalizer for digital data transmission systems is improved to incorporate an automatic control for the magnitude of tap-gain incrementation adaptive to the absolute magnitude of the data error signal.

3,781,721
ACOUSTIC SURFACE WAVE DEVICE ELIMINATING SPURIOUS END REFLECTIONS

Gordon W. Judd, Yorba Linda, and Charles R. Stout, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 30, 1972, Ser. No. 311,007
Int. Cl. H03h 7/30, 9/32; H01v 7/00
U.S. Cl. 333—30 R **10 Claims**



An acoustic surface wave device is disclosed wherein spurious response levels are considerably reduced. The ends of an elongated substrate capable of propagating acoustic surface waves are rounded to allow acoustic surface waves launched on the front broad face of the substrate to propagate around these ends to the reverse broad face of the substrate. A roughened area is provided on the reverse broad substrate face to dissipate the acoustic surface waves propagated thereto by scattering.

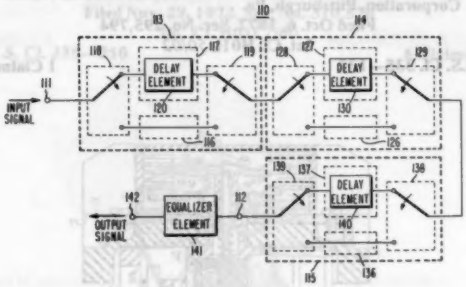
3,781,722
DIGITALLY VARIABLE DELAY TIME SYSTEM

Paul Bruce Pierson, Delran, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,544
Int. Cl. H03h 7/22, 7/30
U.S. Cl. 333—31 R **4 Claims**

A system for providing a digitally variable delay time for electrical signals utilizes a connection of multiple delay line

sections each of which contributes to the overall system delay time. Each delay line section comprises first and second



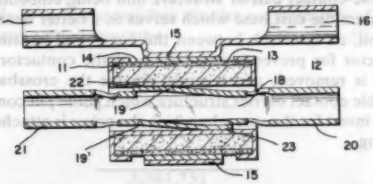
selectable transmission lines having different electrical lengths and a different magnitude of attenuation per unit length.

3,781,723

COATED FERRITE FILTERS HAVING STAMPED AND FORMED OUTER SLEEVES

Robert George Harwood, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 21, 1972, Ser. No. 219,817
Int. Cl. H01h 7/14
U.S. Cl. 333—79 **8 Claims**



A lossy filter includes an extruded tube of ferrite with a layer of dielectric such as barium titanate deposited on the outside of the tube. A conductive sleeve is stamped out of sheet metal and die formed around the tube to form an outer sleeve which adds mechanical strength to the filter. Provision of the said outer sleeve permits the use of a high force center contact spring. This center contact spring has a contact section of substantially the same length as the tube. Spring contacts are pivoted from both ends of a contact section, one spring contact located on one side of the contact pin and the other on the other side of the contact pin. The free ends of both spring contacts are deflected when the pin is inserted in the tube to provide opposite high force contacts between the pin and the tube.

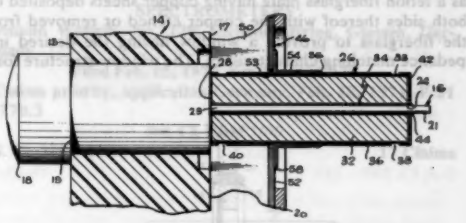
3,781,724

TERMINAL BLOCK

Leonard Moore, and Ronald L. Bodle, both of Northridge, Calif., assignors to Moore Industries Inc., Van Nuys, Calif.

Filed May 30, 1972, Ser. No. 257,779
Int. Cl. H01h 7/14
U.S. Cl. 333—79 **18 Claims**

The invention is characterized by a terminal block formed in part from insulating material. The terminal block is designed to be attached to a housing surrounding electronic equipment which is affected by radio frequency signals. The terminal block is provided with connector pins which extend through the bores of tubular rf filters. These filters are designed to block the entry of rf signals to the interior of the housing and to short out the rf signals to a ground plane which is also a part of the terminal block. The ground plane is electrically connected to the housing and to the rf filters at a point



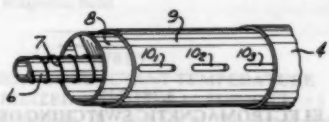
intermediate their ends. In addition, adjustment are provided to control the penetration of the pins and filters on the terminal block inside the housing.

3,781,725

LEAKY COAXIAL CABLE

Kenichi Yoshida, and Yoshio Miyamoto, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 4, 1972, Ser. No. 250,277
Int. Cl. H01q 13/22; H01p 3/06
U.S. Cl. 333—84 R **8 Claims**



The present invention provides a leaky coaxial cable for communication with moving vehicles which comprises an inner conductor with delaying properties for an electro-magnetic wave and an outer conductor having a slot arrangement made of an oblique slot arranged repeatedly in a constant period or made of a group of oblique slots arranged repeatedly in a constant period, with said slots of each group being arranged in a different period therein. When such a leaky coaxial cable is installed along a track for a moving vehicle and fed by a communication signal of a very low frequency band as around 30 MHz, the coupling level fluctuation between the leaky coaxial cable and the antenna of a mobile unit in accordance with the movement thereof is extremely reduced even over such low frequency band and furthermore the operable frequency band width is made broader.

3,781,726

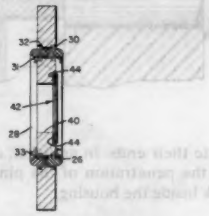
WAVEGUIDE WINDOW ASSEMBLY

Richard M. Thompson, Anaheim, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 31, 1972, Ser. No. 287,187
Int. Cl. H01p 1/08
U.S. Cl. 333—98 P **1 Claim**

A waveguide gas pressure window that in a single assembly provides a waveguide window and a pressure seal to gases used as a dielectric, while at the same time providing a low loss transfer of power through the window from a first waveguide section into a second waveguide section. The improved waveguide window includes a plate having the shape of the waveguide flange with a seal material positioned in a groove on both sides of the plate to contact the two waveguide flanges

between which the window is mounted. The flat plate has a common flanged opening formed on one side thereof in which a window structure is positioned on shoulders and firmly bonded in position with a suitable retaining material. The window structure is formed of a suitable dielectric material such as a teflon fiberglass plate having copper sheets deposited on both sides thereof with the copper etched or removed from the fiberglass to provide a window having the desired impedance matching characteristics. The window structure for a



selected waveguide size may have a common outside dimension for being positioned in the flat plate while allowing desired electrical and impedance changes to be provided during manufacture by selecting the dimensions of the surface from which copper is removed. The improved and simplified pressure window assembly in accordance with the invention provides complete electrical continuity, eliminates RF energy leakage and simplifies alignment of the adjacent waveguide sections.

3,781,727

ELECTROMAGNETIC SWITCHING DEVICE

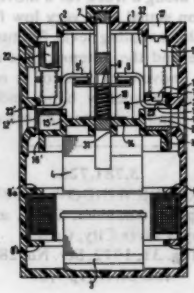
Fritz Pollmann, and Gerhard Wossner, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 27, 1971, Ser. No. 147,317

Claims priority, application Germany, June 3, 1970, P 20 27 137.8

Int. Cl. H01h *50/04*

U.S. Cl. 335—132 **3 Claims**



An electromagnetic switching device has a housing comprising two housing parts for accommodating contact and terminal parts and a magnetic system. A separate switching chamber is formed in the housing and has outer wall portions integrally formed with the housing parts to provide form-locking support for frame clamps of the device.

3,781,728

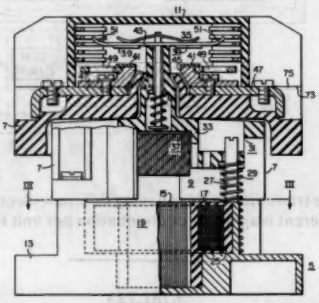
ELECTRIC CONTACTOR

Kurt A. Grunert; John J. Dauer, Jr., and Stephen S. Dobrosielski, all of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1972, Ser. No. 295,794

Int. Cl. H01h *50/02*

U.S. Cl. 335—132 **1 Claim**



An electric contactor characterized by improvements including a movable contact carrier structure having a one piece bridge between a pair of movable contacts, the outer ends of which bridge are curved outwardly away from the corresponding stationary contacts, a magnetic coil for actuating the movable contact carrier structure and being embedded in an aluminum die cast base which serves as a better heat sink for the coil, an interlock between the cover and housing of the contactor for preventing operation of the contactor when a cover is removed, and a guide pin for the crossbar of the movable contact carrier structure which guide pin comprises a screw insert for the screw by which the cover is attached to the housing.

3,781,729

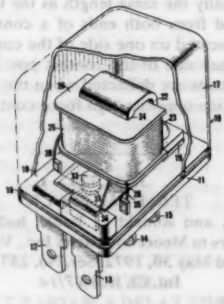
INVERTED LOW LOSS RELAY STRUCTURE

Rodney Hayden, Stacy Creek, Ontario, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Sept. 25, 1972, Ser. No. 291,867

Int. Cl. H01h *50/14*

U.S. Cl. 335—187 **4 Claims**



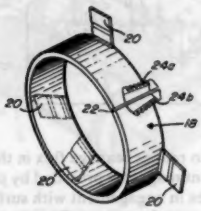
The following specification sets forth a structure defining an electrical relay of the direct current high amperage type adapted for automotive use and in which the relay contacts are so arranged relative to the terminals as to provide a short low resistance path.

3,781,730

YOKE MOUNTING RING WITH DEFORMABLE FINGER MEMBERS

Edward A. Salners, Mount Prospect, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 29, 1972, Ser. No. 310,526
Int. Cl. H01f 7/00
U.S. Cl. 335—210 6 Claims



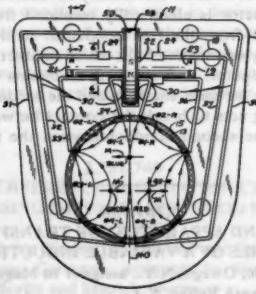
A ring mounting device for receiving a deflection yoke and maintain the same in a fixed, selectively adjusted position on the neck of a cathode ray tube. The mounting ring includes a plurality of fingers extending therefrom for physical attachment to the bell portion of the cathode ray tube, such as by an adhesive tape or the like. The entire mounting ring is constructed in a one-piece molded configuration from a plastic, nonmetallic material so as to avoid static-charge buildup. Additionally, the associated finger members are deformable so as to accomodate the size requirements of substantially any cathode ray tube.

3,781,731

PURITY AND BLUE LATERAL ASSEMBLY FOR DELTA BEAM TYPE CATHODE RAY TUBE

Lawrence R. Poel, 6620 Mesa Grande, El Paso, Tex.

Filed Mar. 23, 1973, Ser. No. 344,222
Int. Cl. H01f
U.S. Cl. 335—212 10 Claims



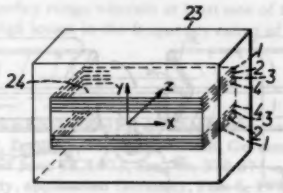
A static magnetic assembly for delta beam type cathode ray tubes for providing proper convergence adjustment of the electron beams.

3,781,732

COIL ARRANGEMENT FOR ADJUSTING THE FOCUS AND/OR CORRECTING THE ABERRATION OF STREAMS OF CHARGED PARTICLES BY ELECTROMAGNETIC DEFLECTION, PARTICULARLY FOR SECTOR FIELD LENSES IN MASS SPECTROMETERS

Hermann Wollnik, No. 129, Eichendorffring, Giessen, Germany

Filed Feb. 15, 1972, Ser. No. 226,479
Claims priority, application Germany, Feb. 18, 1971, P 21 07 770.3
Int. Cl. H01f 5/00
U.S. Cl. 335—213 17 Claims



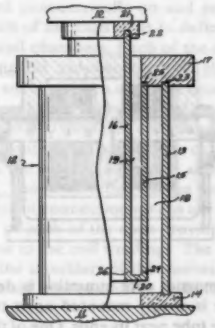
A coil arrangement for adjusting the focus and/or correcting the aberration of streams of charged particles by electromagnetic deflection, particularly for sector field lenses in mass spectrometers, comprises flat coils produced in accordance with conventional printed circuit technology. Part of the turns of each coil is shaped to produce a locally changing magnetic field normal to the stream of charged particles for differentially affecting the particle paths according to their position in this magnetic field.

3,781,733

LOW HEAT CONDUCTANT TEMPERATURE STABILIZED STRUCTURAL SUPPORT

Joseph R. Heim, Batavia, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Dec. 21, 1972, Ser. No. 317,454
Int. Cl. H01f 7/22
U.S. Cl. 335—216 7 Claims



A low heat conductant structural support has a series of concentric and spaced tubular columns to thermally insulate and support a load above a base. The outer tubular column is vertically mounted on and may be thermally insulated from the base while the supported load is supported on and may be thermally insulated from the upper rim of the inner column. Intermediate columns join the upper rim of the outer column to the lower rim of the inner column. The columns of the support can be composed of materials such that the over-all ther-

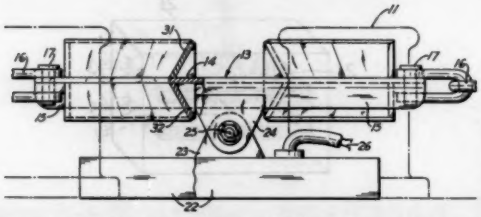
mal contraction of the intermediate columns is equal to the sum of the thermal contraction of the inner and outer columns so that, consequently, the over-all height of the support and correspondingly the distance between the supported load and the base is the same after the temperature has been decreased.

3,781,734

MAGNETIC DEVICE FOR CONNECTING HAULING LINES TO A BARGE

William E. Sabina, Sewickley, Pa., assignor to Heyl & Patterson, Inc., Pittsburgh, Pa.

Filed Jan. 24, 1973, Ser. No. 326,246
Int. Cl. H01f 7/20
U.S. Cl. 335—289 **10 Claims**



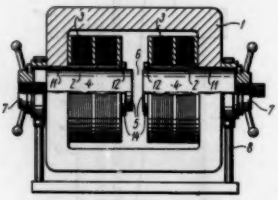
Connected to each end of a supporting member are means for connecting that member to barge hauling lines. Suspended below the supporting member are electromagnetic means positioned to rest on the deck of a barge for magnetically attaching the supporting member to it. The opposite ends of the supporting member may be provided with recesses for receiving the barge bitts to limit sliding of the magnetic means along the deck.

3,781,735

APPARATUS FOR ADJUSTING MAGNET CORES

Joerg Philipp Haas, Neureut, Germany, assignor to Bruker-Physik AG, Karlsruhe-Forchheim, Germany

Filed Aug. 28, 1972, Ser. No. 284,048
Claims priority, application Germany, Sept. 15, 1971, P 21 46 032.2
Int. Cl. H01f 3/00
U.S. Cl. 335—298 **7 Claims**



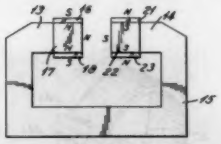
An improved magnet core mounting is described in which the magnet core is snugly mounted upon two support rings located in a guide tube near its ends. One of these rings is fixed to the guide tube and has a convex spherical surface bearing against the magnet core and the other is radially adjustable in the guide tube. The magnet core has sufficient play in the guide tube to permit the adjustable support ring to correct the position of its pole face; and the convex spherical surface of the fixed support ring cooperates in permitting this adjustment. The radially adjustable support ring is positioned by four screws set 90° apart about the circumference of the ring. Advantageously, two of these screws bear the weight of the magnet core while the other two bias springs against the core.

3,781,736

SHIELD FOR PERMANENT MAGNET STRUCTURE

Rollin J. Parker, Greenville, Mich., assignor to General Electric Company

Filed Oct. 26, 1972, Ser. No. 301,094
Int. Cl. H01f 7/02
U.S. Cl. 335—304 **5 Claims**



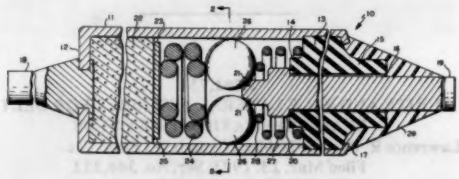
A shield or guide to reduce leakage flux in the vicinity of the air gap of a permanent magnet is provided by positioning magnetic sleeves or plates in engagement with surfaces of the permanent magnet adjacent the air gap. The sleeves or plates are polarized at their surfaces which engage the permanent magnet. Each sleeve or plate has its surface which abuts the permanent magnet of the same polarity as the portion of the permanent magnet which it engages. The sleeves or plates may be flexible. Ferrites and cobalt-rare earths are satisfactory magnetic materials for the sleeves and plates.

3,781,737

THERMAL CIRCUIT PROTECTOR

Wesley D. Henry, Logansport, Ind., assignor to Essex International, Inc., Ft. Wayne, Ind.

Filed Feb. 20, 1973, Ser. No. 333,947
Int. Cl. H01h
U.S. Cl. 337—407 **3 Claims**



A thermal circuit protector for automatically opening a circuit when the ambient temperature becomes too high. The protector comprises a fusible pellet disposed inside a conductive case. A first conductor electrically contacts the case while a second conductor is electrically insulated from the case. Contact is made from the first conductor to the second by three electrically conductive balls which contact the case and the second conductor. A first spring maintains the electrical contact between the case, the balls and the second conductor. A second spring acts to break the contact between the case, the balls and the second conductor when the fusible pellet melts.

3,781,738

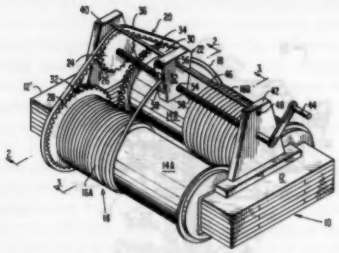
METHOD AND APPARATUS FOR TRANSFERRING MOVABLE COILS OF A VARIABLE INDUCTION DEVICE

Donald S. Rozelle, Owego, N.Y., assignor to Magnetech Industries, Inc., Newark Valley, N.J.

Filed Jan. 20, 1972, Ser. No. 219,397
Int. Cl. H01f 21/02
U.S. Cl. 336—15 **13 Claims**

A method and apparatus for transferring the turns and windings of a movable coil between two drum portions, such as either from one drum to another or from one position on a drum to another postion thereon, in response to the rotation

of the drum portions. The coil includes an intermediate portion extending between the drum portions and resilient guide means is provided to guide the coil as it is transferred and to allow the intermediate portion to vary slightly in length during



the transfer of the coil so that the intermediate portion is not subject to excessive slack and stress. In addition, a drive means if provided to rotate the drum portions in synchronism when the drum portions comprise, for example, two independently mounted drums.

3,781,739

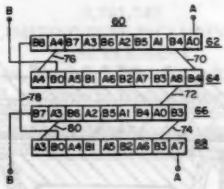
INTERLEAVED WINDING FOR ELECTRICAL INDUCTIVE APPARATUS

Lloyd E. Meyer, Greenville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1973, Ser. No. 345,813

Int. Cl. H01f 15/14

U.S. Cl. 336—70 **4 Claims**



A transformer winding with coil disc sections having an odd number of conductor-turns per section. During construction, one section is wound with a pair of conductors to provide one less conductor-turn that is desired in that section. Another section is similarly wound with the same pair of conductors to provide one less conductor-turn than is desired. One of the conductors is then crossed-over to the previously wound section so that one conductor may be wound around each section for one additional turn. A splice joint in the previously wound section connects the conductor wound thereon to the proper conductor-turn.

3,781,740

RADIO INTERFERENCE ELIMINATION CHOKE FOR SUPPRESSING IMPULSE LIKE INTERFERENCE VOLTAGES

Peter Kirmis; Heinz Wagner, and Hans-Peter Kaiserswerth, all of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

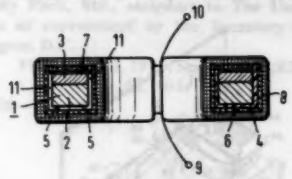
Filed Nov. 24, 1971, Ser. No. 201,754

Claims priority, application Germany, Nov. 27, 1970, P 20 58 509.5

Int. Cl. H01f 27/24

U.S. Cl. 336—96 **10 Claims**

A radio interference elimination choke employs a magnetic impedance core having at least two annular axially superposed partial cores housed in an insulating omnilaterally closed cup upon which at least one winding is provided for attenuation of impulse-like interference voltages and build-up interferences



in the low frequency range wherein at least one of the partial cores exhibits high losses in the frequency range of the build-up process.

3,781,741

TRANSFORMER ASSEMBLY

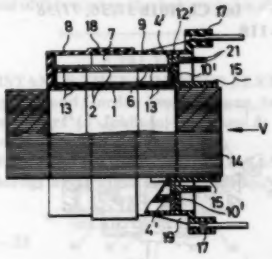
Norbert Weiner, Pernze 5275, Bergneustadt, Germany

Filed June 18, 1973, Ser. No. 370,871

Claims priority, application Germany, Feb. 6, 1973, P 23 05 700.3

Int. Cl. H01f 15/10, 27/30

U.S. Cl. 336—192 **10 Claims**



A transformer assembly having a plurality of annular shaped coil chambers and adapted to receive ferromagnetic laminations and coils has a pair of insulating caps each of which includes a plurality of integrally-formed annular ribs. The annular ribs are disposed concentrically on and perpendicular to the front wall of each of the caps so as to define a plurality of concentric hollow coil chambers. Each of the chambers has a substantially rectangular cross-section. A plurality of coil sleeves is provided each having a different cross section so as to correspond with each of the ribs. Each of the coil sleeves includes end flanges and a shoulder complementary with the respective rib. The front wall of at least one cap contains apertures as directed to the connecting flange side of the respective coil chamber. The connecting flange side bears overlapping teeth. Electrical connection means are disposed along the outside portion of each of the caps providing a means for electrical connection to the coil windings. The ribs are placed so as to seat along the shoulders of the sleeves thereby defining a plurality of closed coil chambers and included in a coil space devoid of any ribs.

3,781,742

THERMALLY ACTUATED SWITCH

Donald F. Dalziel, Sturtevant, and Charles H. Heide, Kenosha, both of Wis., assignors to Webster Electric Company, Inc., Racine, Wis.

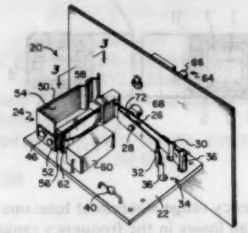
Filed Dec. 3, 1971, Ser. No. 204,491

Int. Cl. H01h 71/16

U.S. Cl. 337—77 **24 Claims**

A thermally actuated, temperature compensated switch includes a bimetallic member and leaf spring members mounted

on one or more printed circuit boards. The bimetallic member and the leaf spring members include lateral extensions extending through and secured to a printed circuit board. Means are



provided for monitoring plural conditions in an electrical circuit and for changing the state of the thermally actuated switch upon the occurrence of a fault condition in the electrical circuit.

3,781,743

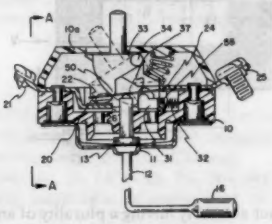
MANUAL RESET FOR A SWITCH DEVICE

Donald P. Kolbow, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 27, 1972, Ser. No. 266,796

Int. Cl. H01h *37/36, 71/58*

U.S. Cl. 337—118 **6 Claims**



A condition responsive switching device has a manual reset provision in which a pressure responsive actuator has a pin providing an output force to be applied against a moveable contact blade of a switch. A wedging member is spring biased between the base and the blade so that upon movement of the moveable blade to an open switch position, the wedging member is moved along adjacent to the blade to hold the blade and thus the contact in an open switch position. After the pressure responsive actuator returns to the normal position, a reset operation is accomplished by a pivoting reset driver which is operated upon pushing a reset button to slide the wedging member against its bias spring back to an initial position to allow the moveable blade to move to a closed switch position.

3,781,744

MANUAL RESET FOR A SWITCH DEVICE

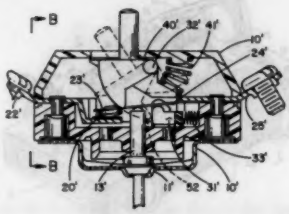
Elwyn H. Olson, St. Paul, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed June 27, 1972, Ser. No. 266,797

Int. Cl. H01h *71/50, 61/01, 35/26*

U.S. Cl. 337—118 **5 Claims**

A condition responsive switching device has a manual reset provision in which a pressure responsive actuator has a pin for providing an output force to be applied against a movable blade of a switch contact. A movable member is spring biased between a base and the blade so that upon movement of the movable blade to an open switch position, the movable member is moved along with the blade to hold the blade and its contact in an open switch position. After the pressure responsive actuator returns to the normal position, a reset operation is accomplished by a pivoting reset driver which is



operated upon pushing a reset button to move the movable member against its biasing spring back to a position to allow the movable blade to move its contact to a switch closed position.

3,781,745

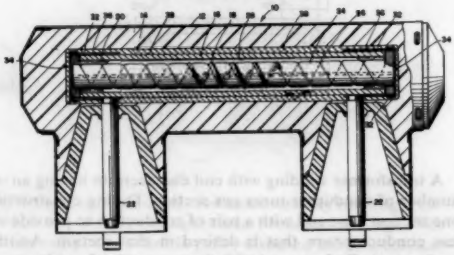
FUSED COUPLER ASSEMBLY

Ramanlal R. Vadnagara, Chicago, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Sept. 10, 1969, Ser. No. 856,691

Int. Cl. H01h *85/02*

U.S. Cl. 337—199 **1 Claim**



A fused coupler assembly includes a submersible conductive housing used in underground distribution systems. The housing contains a dielectric filler in which a cylindrical resistor shield encompassing a fuse element is located. The cylindrical shield is formed of a tube coated with a resistance material so that a shield is formed of sufficiently low resistance to prevent corona from occurring between the tube and the fuse element. The coating shield also is of sufficiently high resistance to minimize line-to-ground leakage when the fuse element is blown during a fault condition.

3,781,746

EXPULSION FUSE AND SUPPORT MEANS

Raymond Cuzzone, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

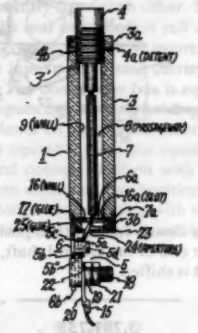
Filed Aug. 4, 1972, Ser. No. 278,030

Int. Cl. H01h *85/02*

U.S. Cl. 337—204 **10 Claims**

An expulsion fuse that is adapted to be immersed in operating position in a fluid coolant of a transformer is provided with

a support means to facilitate installation of the fuse in vibration-resistant relationship within the transformer. The support means includes a rigid angle support member having a coupling stud positioned on it for clamping a lead from the



transformer primary winding in operating relationship to one terminal of the fuse. The fuse is also characterized by having a baffle means that restricts the flow of transformer coolant around the fusible link of the fuse when it is immersed in the coolant.

3,781,747

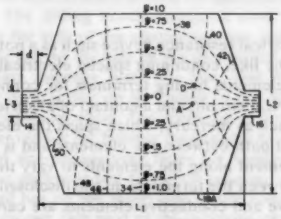
CURRENT LIMITING FUSE INCLUDING IMPROVED FUSE ELEMENT

Donald D. Blewitt, Pittsburgh, Pa., and David L. Ayers, West Lafayette, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 18, 1972, Ser. No. 254,598

Int. Cl. H01h 85/64

U.S. Cl. 337—295 **5 Claims**



A current limiting fuse including an improved fuse element. The fuse element or link includes portions or regions of reduced cross-section which melt during overload to form a series of voltage arclets. The fusible material of the fuse element between notched regions of reduced cross-section is uniquely shaped to take advantage of electrical potential distribution within it, and the natural tendency of electrical current to flow from notch to notch in specified paths of least resistance. The fuse link has a predetermined geometric shape to accommodate the flow of current in an efficient manner and to eliminate those portions of the fuse link which conduct little or no electrical current during normal operation.

3,781,748

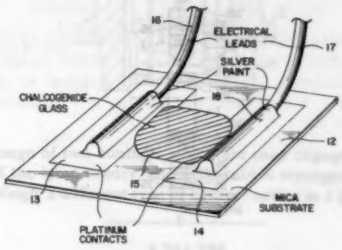
CHALCOGENIDE GLASS BOLOMETER

Stephen G. Bishop, Arlington, Va., and William J. Moore, University Park, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1971, Ser. No. 147,931

Int. Cl. H01c 7/08

U.S. Cl. 338—15 **6 Claims**



A chalcogenide glass bolometer for detection of electromagnetic radiation at wavelengths varying from infrared to microwave. The radiation absorbed by the glass increases its electrical conductivity, enabling measurement of the radiation. A method of fabricating the bolometer is also disclosed.

3,781,749

RESISTANCE THERMOMETER ELEMENT

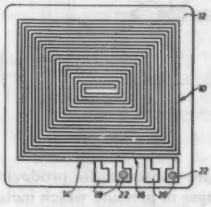
Gerald Sidney Iles, and Gordon Leslie Selman, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Nov. 13, 1972, Ser. No. 305,657

Claims priority, application Great Britain, Nov. 18, 1971, 53,655/71

Int. Cl. H01g 7/00

U.S. Cl. 338—25 **26 Claims**

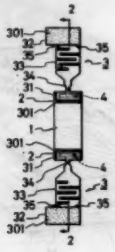


An electrically resistive element suitable for use as the temperature sensitive element of a resistance thermometer comprising a layer of vitreous material loaded with electrically conducting particles secured to an electrically non-conducting substrate. Preferably the particles are flakes or platelets of platinum. The element includes two tortiles or sinuous paths of the fused vitreous material in side by side relationship and interconnected at one end to form a non-inductive electrically conducting path and in the case of a multilayered structure, electrically interconnected layers of material are separated by intermediate layers of a dielectric material. A dispersion of the particles and powdered vitreous material in an organic medium is screen printed on the substrate and fired to fuse the vitreous material. The two paths may be printed on the substrate or may be cut by laser beam from a single layer printed on the substrate or intermediate layer. The substrate may form part of the surface of a body whose temperature is to be measured, may be a wafer of alumina, or in the case of a monolithic multilayered structure, a layer of the dielectric material from which the intermediate layers are formed.

3,781,750
GALVANO-MAGNETRO EFFECT DEVICE

Hisashi Takiguchi, Tokyo, Japan, assignor to Denki Onkyo Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,954
Int. Cl. H01c 7/16
U.S. Cl. 338—32 R 9 Claims

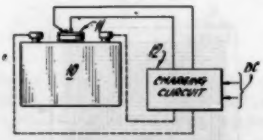


A galvano-magnetro effect device in which the lead frames respectively comprised of a member part meandering alternately in opposite directions which is positioned between the coupling end to be connected to the electrode and the connecting end to be connected are connected to the electrodes of the semiconductor elements.

3,781,751
PRESSURE TRANSDUCER

Harold Sulger, Sr., East Northport, Long Island, N.Y., assignor to Dynamic Instrument Corp., Plainview, L.I., N.Y.

Filed May 18, 1972, Ser. No. 254,441
Int. Cl. H01c 13/00
U.S. Cl. 338—42 8 Claims



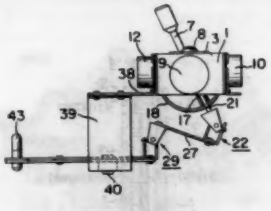
A battery pressure transducer for producing a change in resistance with changes in pressure which includes a diaphragm having one side subject to pressure and the other side carrying a conductive layer. An annular resistive element is placed in slightly spaced relationship to the conductive layer and has a center contact and an outer peripheral contact. As pressure deflects the diaphragm, the conductive layer shunts part of the resistance and, thus, decreases the resistance between the contacts by an amount proportional to the pressure.

3,781,752
DEVICE FOR CONTROLLING SIMULTANEOUSLY A PLURALITY OF VARIABLE RESISTORS

Shunzo Oka, Hirakata-shi, Osaka, and Matsuo Nishioka, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka-fu, Japan

Filed Sept. 15, 1972, Ser. No. 289,475
Claims priority, application Japan, Sept. 20, 1971, 46/85979; Oct. 12, 1971, 46/94278
Int. Cl. H01c 13/00
U.S. Cl. 338—128 4 Claims

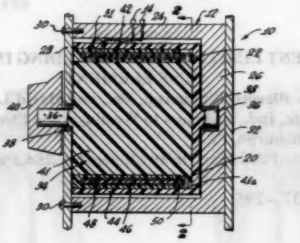
A display device for displaying the interrelation among the controlled resistances of a plurality of variable resistors is provided for a device for controlling simultaneously a plurality of variable resistors by a single operating or control shaft. The display device may clearly indicate the position of a point, for example, the lower end of the control shaft, which is displaced as the control shaft is shifted.



3,781,753
VARIABLE RESISTANCE CONTROL USING MERCURY CONTACT

James F. Lawrence, Jr., 13161 Barret Hill Cir., Santa Ana, Calif.

Filed Nov. 10, 1971, Ser. No. 197,414
Int. Cl. H01c 5/00
U.S. Cl. 338—151 11 Claims



A variable electrical resistance device such as a potentiometer, rheostat or the like, containing spaced electrical resistive and conductive elements having terminals for connection to an external electrical circuit, and a contact of electrically conductive liquid, such as mercury, which spans the elements to provide a current path between the elements and is confined for relative movement along the elements to vary the electrical resistance between the terminals. In the disclosed embodiment, the resistive and conductive elements are carried by a rotor which is rotatable to effect movement of the elements past the mercury contact.

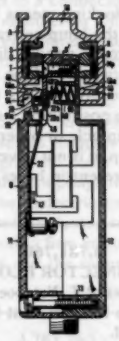
3,781,754
LIGHTING DEVICE

Heinz Seelbach, Kierspe, Germany, assignor to Firma Reininghaus & Co., Brockhauser Ebene, Ludenscheid, Germany

Filed Dec. 8, 1971, Ser. No. 205,967
Claims priority, application Germany, Dec. 8, 1970, P 20 60 262.4
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 4 Claims

A lighting device which comprises a carrier rail open on one side and to be secured to a securing face and including a con-

duit rail carrier. A connection box has a receiving channel. The carrier rail includes on both sides of the receiving channel holding tongues-receiving grooves as well as a plurality of electric conduit rails, each in a conduit rail carrier arranged in pairs in planes and mirror symmetrically to a longitudinal center plane extending from the insert side to the securing side of the carrier rail and disposed on top of each other, accessible from the inside, and forming a plurality of current circuits operating independently from each other. Three conduit rails constitute pole rails and one conduit rail constitutes a zero-conduit rail. The connection box is insertable with a set-off head part into the inner part of said carrier rail and carrying lighting members. The connection box is equipped with a plurality of spring tongues constituting holding- and contact-tongues disposed in planes on top of each other and by means of a switching member operable from the outside selectively into an engagement and contact position with a pole- and zero-conduit-rail and into an inoperative position, respectively, and with a grounding tongue cooperating with a special grounding rail. The carrier rail receives at its insert side of the connection-box within a side stay of the carrying rail the grounding rail projecting one-sided relative to the side-stay inwardly on parts of its cross-sectional width into the receiving channel of the connection box. A grounding contact on the side of the connection box cooperates with the grounding rail as a sliding contact. The sliding contact projects over parts of its total length on the side of the connection box pointing toward the grounding rail on the side of the carrier rail with a slide contact section laterally from the box, and biased in contact direction by a spring on the inside of the box outside of the sliding contact location. The receiving grooves on the side of the carrier rail for the holding tongues are formed with the formation of line-engagement faces for supporting the holding tongues as undercut and freely cut grooves, respectively. The carrier rail has on the insert side of the connection box, outside and on one side next to the receiving channel of the connection box a worked-in, continuously passing-through guide groove and accessible from the side of the carrier rail, and a guide ledge projection cooperates with the guide groove on the corresponding side of the connection box.



3,781,755

LAMP HOLDER

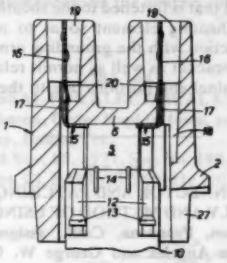
Sergio Pitacco, Turin, Italy, assignor to ITT Industries, Inc., New York, N.Y.

Filed July 19, 1972, Ser. No. 273,066

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **6 Claims**

A lamp holder having a molded body of plastic material formed with a dead inner cavity having a shaped profile and suitable to fit with the profile of the glass base of the lamp. The cavity is provided on the bottom thereof with two openings for the passage of two contacts which are snap engaged with the body of the lamp holder, and a side slit is arranged to permit alternatingly a different type of contact acting as a ground.



3,781,756

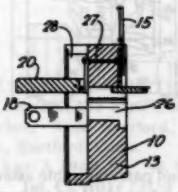
CONSTRUCTION PLUG

Gus J. Kyranakis, Levittown, N.Y., assignor to Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 6, 1972, Ser. No. 286,736

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 RP **1 Claim**



A male electrical plug for use in connecting the supply line of portable electrical tools and appliances to a female socket, said plug being equipped with a retractable ground prong which may be folded out of the way when the plug is mated to a female socket which does not have a female ground receptacle. The ground prong of the plug is mounted to a hinge by a rotatable pin, and is electrically connected to a short attachment wire so that in the retracted state, the ground connection of the line cord may be made by fastening said attachment wire to an external ground connection.

3,781,757

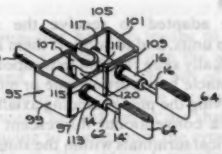
GROUNDING CLIP FOR PLUG-IN SURFACE HEATING UNIT

Emmett W. Barnes, Batavia, Ill., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 4, 1972, Ser. No. 312,030

Int. Cl. H01r *15/06*

U.S. Cl. 339—14 L **7 Claims**



A plug-in electric surface heating unit for use in the cooktop of an electric range. The heating unit is a metal sheathed elec-

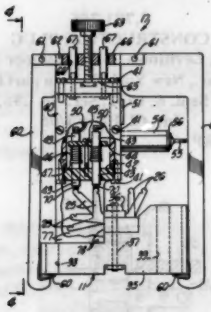
trical resistance heating element in spiral form with radial, outwardly directed terminal portions in close side-by-side relation. The invention relates to a four-sided grounding clip of spring material that is fastened to the sheath at the terminal portions of the heating element so as to make a reliable grounding connection with the grounding arms of a terminal block mounting bracket as well as permit relative movement between the terminal end portions due to thermal expansion and contraction.

3,781,758

GANG CONNECTOR AND PATCHING CABLE ASSEMBLY AND METHOD OF USING SAME

Karl R. Anderson, Pasadena, Calif., assignor to John T. Thompson, Los Angeles and George W. Gillemot, Santa Monica, Calif.

Filed Feb. 26, 1971, Ser. No. 175,281
Int. Cl. H01r *13/54*
U.S. Cl. 339—29 **4 Claims**



A gang connector and patching cable assembly and method for maintaining uninterrupted communication service between components of a central telephone office facility while certain permanent components therein are being serviced or replaced. The patching cable serves to bridge components and conductors undergoing repair, consolidation or replacement and includes flexible patching cabling equipped with detachably coupled gang connectors having provision for simultaneously connecting each end of a multiplicity of the patching cable conductors to individual terminals of remotely located terminal boards thereby providing temporary bypass connections in parallel with conductors of the permanent central station equipment while the latter are undergoing servicing. The gang connectors have various unique features including independently movable contactors provided with sets of sharp pointed pins fused to their outer ends.

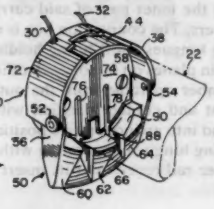
3,781,759

FLUORESCENT LAMP RECEPTACLE

Newton L. Shelly, Jr., Denton, Tex., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Aug. 14, 1972, Ser. No. 280,472
Int. Cl. H01r *13/62*
U.S. Cl. 339—54 **8 Claims**

A receptacle adapted to receive the end portions of fluorescent lamp units, and to support them in a mechanically as well as electrically snug relation in position of use. The unit includes a receptacle base portion, one or more slots disposed therein for receiving the pins extending axially from metal end cap portions of a conventional fluorescent lamp, resiliently positioned electrical terminals within the slots, means for positioning the end portion of the lamp against movement in all radial directions relative to the lamp axis, and axially movable locking means movable between at least one open position permitting movement of the lamp end cap portion into a desired position of registration within the receptacle, and at least one other position for partially surrounding the end portion of the lamp for locking the lamp against the positioning means. In use, the movable retainer is positioned axially beyond the end of a lamp end cap, and a lamp is inserted with the lamp pin aligned with the slot. The movable retainer is then urged axially inwardly with respect to the lamp to engage the end cap, to retain the lamp snugly in position of use. In preferred embodiments, the insertion of the lamp activates biasing means for biasing the locking means axially into the



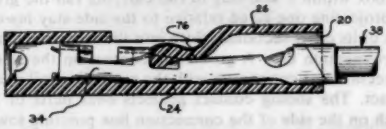
lamp-retaining position. Also, in a preferred embodiment, axial movement of the locking means in the direction axially away from the body of the lamp activates ejection means for positively urging the lamp in a radial direction with respect to the axis of the lamp outwardly of the receptacle. In use, the locking means, which snugly engages the end cap portion of the lamp may be held in position by a spring unit, by a detent associated with the receptacle or otherwise. Since the lamp is supported by the end cap, it is not adversely affected by vibration, particularly that present in buses, railborn vehicles, airplanes, and the like.

3,781,760

CONNECTOR BLOCK

Lloyd Mancini, and Howard T. Ysteboe, both of New Cumberland, Pa., assignors to E. I. du Pont De Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1972, Ser. No. 238,889
Int. Cl. H01r *13/48*
U.S. Cl. 339—59 M **6 Claims**



A terminal receiving snap latch type connector block having an improved flexible latch. Application of a force tending to pull the terminal from the block distorts the latch for improved terminal retention.

3,781,761

HARWOOD RETAINER

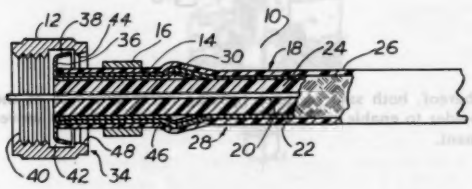
Channing E. Harwood, 145 Frederick St., Torrington, Conn.

Filed Mar. 27, 1972, Ser. No. 238,066
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 P **1 Claim**

A retainer for preventing accidental pulling apart of a plug and socket connecting the ends of electrical conductors com-

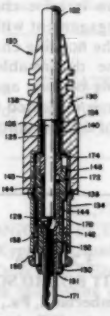
prising a strip of flexible material with spaced apertures and openings to the edge of the strip from each aperture.

3,781,762
CONNECTOR ASSEMBLY
Edward Clarke Quackenbush, Staatsburg, N.Y., assignor to Tidal Sales Corporation, Poughkeepsie, N.Y.
Filed June 26, 1972, Ser. No. 265,973
Int. Cl. H01r *13/30*
U.S. Cl. 339—89 C **1 Claim**



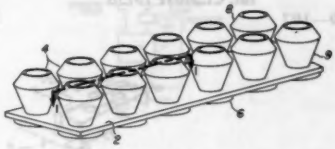
This disclosure relates to a connector assembly which utilizes a hollow coupling member or ring having an internally threaded portion at one end thereof and a cylindrical recess at the other end thereof which serves to hold one end of a tubular shaped member that is adapted to make connection to the outer conductor of a coaxial cable. The tubular shaped member not only functions to contact the outer conductor of a coaxial cable, but also serves to upset a portion of the outer conductor in order to grip the outer conductor and hold it securely connected to the coupling ring. Additionally, a ferrule is located about the dielectric casing and between the upset portion of the outer conductor and the coupling ring so as to more securely provide a firm gripping action between the tubular shaped member and the outer conductor of the coaxial cable.

3,781,763
PLUGBOARD SYSTEM
William Coover Feeser, New Cumberland; Cornelius William Bosland, Hershey; Joseph LaRue Lockard, Harrisburg, and Dale Brice Mummey, Camp Hill, all of Pa., assignors to AMP Domestic Inc., Harrisburg, Pa.
Continuation of Ser. No. 760,379, July 29, 1968, which is a division of Ser. No. 598,014, Nov. 30, 1966, Pat. No. 3,430,183. This application May 5, 1971, Ser. No. 140,411
Int. Cl. H01r *11/18, 13/54*
U.S. Cl. 339—91 P **12 Claims**



A plugboard system comprising opposed contact board means, one of which has receiver means for receiving and securing the other board means, moving it toward and then along the plane of the one board means for contact engagement. The board means are of apertured insulation, metal-coated to form shielding and grounding. One board means has a shielding grid which isolates the mated contact ends from each other and engages the coatings. Patchcord connectors form the contacts on one board means, and insulation-sleeve-mounted spring elements form the contacts in the other board means.

3,781,764
MOISTURE SEAL FOR ELECTRICAL CONNECTOR
Frederick W. Johnson, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.
Filed Nov. 15, 1971, Ser. No. 198,920
Int. Cl. H01b *17/26*; H01r *7/02*
U.S. Cl. 339—94 **10 Claims**



Disclosed is a printed circuit board interconnect system having moisture seal means for precluding the formation of a moisture film between electrical contacts. The seal means comprises a resilient seal strip having one or more integral hollow seals disposed on either side thereof, each hollow seal surrounding a male connecting pin of the system and being compressed between printed circuit boards that are electrically connected.

3,781,765
ELECTRICAL CONNECTORS WITH INTERNAL AND EXTERNAL STRAIN-RELIEF FOR CONDUCTOR WIRES
Harold E. Schleicher, West Hartford, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.
Filed Apr. 3, 1969, Ser. No. 813,216
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 R **3 Claims**

A dead-front connector has two means to grip the wires within the housing, plus a means to grip the whole cord outside the housing, and a seal to prevent bits of foreign matter from entering the housing. The outside means grips the cord as a whole and is made to conform to the shape of any standard size wire reducing to a minimum the crushing force and danger of short circuit. One internal gripping means is the connection between the conductor and its respective contact member. The other internal gripping means grips the insulation of each individual wire so that it is not possible to apply a

force to the terminal connection of any wire and contact by pulling from outside the housing. Pulling the wires out of engagement with their contact members with the attendant danger of causing a short circuit within the housing is thus prevented.

3,781,766

SHROUD FOR AN ELECTRICAL CONNECTOR BLOCK

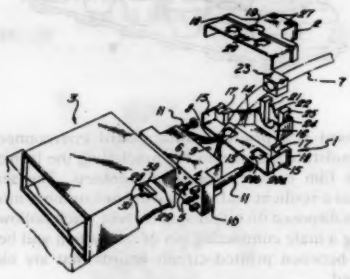
Vladimiro Teagno, and Luigi Campari, both of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 12, 1972, Ser. No. 252,807

Claims priority, application Italy, May 24, 1971, 24916 A/71

Int. Cl. H01r *13/58*

U.S. Cl. 339—107 1 Claim



A shroud for an electrical connector block comprising three elements of insulating material, two of the elements defining a generally hollow housing shell having a forward portion to receive an electrical connector block and a rearward cable clamping portion. Each of the two elements has its rearward portion latching means adapted to engage complementary latching means on the other element. The third element is hollow and has a rearward portion which receives the other two elements which define the hollow housing shell.

3,781,767

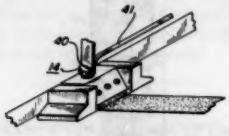
FOIL BLOCK DEVICE

Leo A. Guthart, Old Westbury, N.Y., assignor to Alarm Device Manufacturing Company, Syosset, L.I., N.Y.

Filed Dec. 28, 1970, Ser. No. 101,849

Int. Cl. H01r *11/26*

U.S. Cl. 339—125 R 4 Claims



A foil block device, adapted to provide secure grip retention and protection of a foil strip in a terminal block, for interconnection with a security system.

3,781,768

LAMPHOLDER

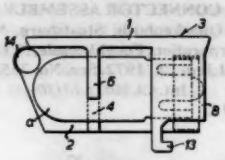
John Arthur Howe, Chilwell, England, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 44,449, June 8, 1970. This application June 30, 1972, Ser. No. 267,763

Int. Cl. H01r *13/54*

U.S. Cl. 339—125 L 3 Claims

A lampholder for capless or wedge base type lamps comprises a body of resilient or semi-resilient plastics shaped to provide a first recess for accommodating the glass envelope of a lamp and a second recess for accommodating the base



thereof, both said recesses opening on to one side of the holder to enable the lamp to be inserted by a lateral movement.

3,781,769

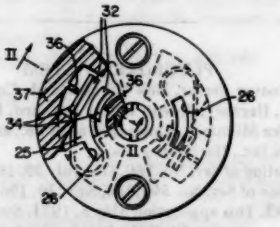
WIRING DEVICE SUCH AS FEMALE CONNECTOR WITH DEFORMABLE INSULATING HOUSING ELEMENT FOR MAINTAINING CONTACT ALIGNMENT

Roy A. Wiley, Huntington, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 15, 1972, Ser. No. 280,938

Int. Cl. H01r *13/50, 21/28*

U.S. Cl. 339—189 R 4 Claims



In a wiring device of the female connector type, female contacts are provided in an interior chamber of an insulating housing for frictional engagement with an inserted blade of a male attachment plug; the housing chamber has fixed interior walls with at least one deformable projection extending therefrom for deformably bearing against the spring contact element when the latter is deflected by an inserted blade to maintain the alignment of the element in use.

3,781,770

CIRCUIT BOARD SOCKET

Lloyd Mancini, New Cumberland, Pa., assignor to E. I. du Pont De Nemours and Company, Wilmington, Del.

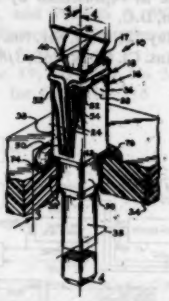
Filed Sept. 23, 1971, Ser. No. 182,953

Int. Cl. H01r *9/12, 11/22*

U.S. Cl. 339—259 R 29 Claims

A circuit board disconnect socket having an elongate hollow body open at one end, a strap surrounding the open end and a pair of contact arms extending from the strap and into

the body. A reinforcing spring is wrapped around the strap and includes spring arms extending along the outside of the



contact arms. Insertion of a lead between the contact arms spreads the arms apart and stresses the spring.

3,781,771

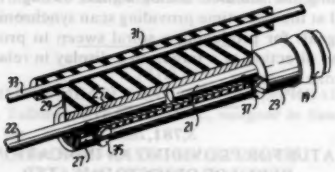
COAXIAL CABLE CONNECTOR

William L. Blake, Elkins Ave., P.O. Box 86, Reedsville, W. Va.

Filed Jan. 29, 1973, Ser. No. 327,854

Int. Cl. H02g *15/08*

U.S. Cl. 339—272 A **2 Claims**



A coaxial cable connector having a conductive sleeve for accepting the terminal ends of the center conductor of the cable and means for securing the conductors within the sleeve. A wire conductor is clamped between the terminal ends of the outer sheath of the cable. The sleeve and the wire conductor are encased in a dielectric material which maintains them in a spaced, substantially parallel relationship.

ERRATUM

For Class 339—37 see:
Patent No. 3,781,913

3,781,772

ULTRASONIC DETECTION APPARATUS

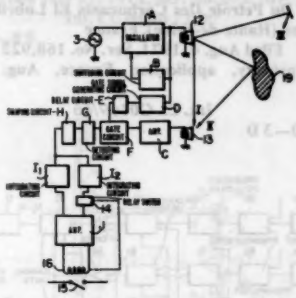
Hiromitsu Inoue, Kyoto; Shinsuke Okamoto, Nishinomiya; Hirokazu Mori, Osaka, and Hirosi Ohasi, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 25, 1972, Ser. No. 229,372

Int. Cl. G01s *9/66*

U.S. Cl. 340—1 R **2 Claims**

An ultrasonic detection apparatus wherein a receiving transducer for receiving ultrasonic waves transmitted from a transmitting transducer is disposed relatively in proximity to the transmitting transducer. A gate circuit is provided between the receiving transducer and a relay circuit so that



only the wave reflected from an object to be detected and reached the receiving transducer will be selectively supplied to the relay circuit.

3,781,773

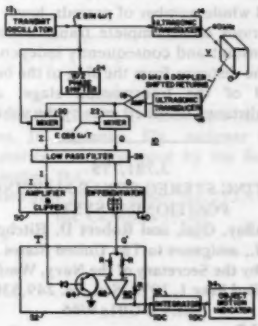
DIRECTION SENSITIVE DOPPLER PROCESSOR

Richard J. Ravas, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 1, 1972, Ser. No. 258,716

Int. Cl. G01s *9/66*; **G08b** *13/16*

U.S. Cl. 340—1 R **4 Claims**



The invention relates to an improvement in direction sensitive ultrasonic Doppler detecting devices wherein an ultrasonic transducer transmits a given freqency signal toward an object which in turn reflects the given signal and Doppler shifted signals based on the movement of the object. The reflected signals including the Doppler shifted signals are processed and evaluated to determine the characteristics of the object movement both as to direction and degree. The insertion of a differentiating circuit in the processing of the reflected signals minimizes false interpretation of the reflected signals caused by non-harmonic oscillatory movement of the object. Furthermore through the addition of a signal processing circuit utilizing a non-linear multiplier circuit for multiplying the instantaneous values of the components of the reflected signals in contrast to the linear multiplication of these signals, the loss of sensitivity of the Doppler detection device as a function of distance is represented as as in the case in the conventional coherent Doppler detection devices.

3,781,774

METHOD FOR DETERMINING THE DISTANCE TRAVELLED OVER BY VEHICLE WITH RESPECT TO A REFERENCE SURFACE, MAKING USE OF THE DOPPLER'S EFFECT AND DEVICE THEREFOR

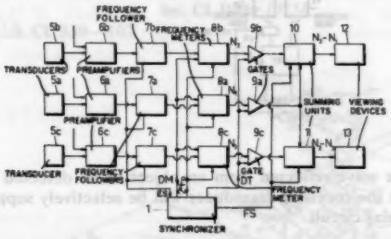
Robert Delignieres, Colombes, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil-Malmaison (Haute-de-Seine), France

Filed Aug. 4, 1971, Ser. No. 168,922

Claims priority, application France, Aug. 13, 1970, 7029970

Int. Cl. G01s 9/66

U.S. Cl. 340—3 D 22 Claims



The method according to this invention comprises transmitting from a ship, acoustic signals of a predetermined frequency along at least one inclined direction with respect to the water bottom surface, detecting the signals reflected from said surface at a receiving location, during steady intervals of time during which the transmission is interrupted, determining the difference between a counting time interval corresponding to a predetermined number of cycles of the transmitted signals and τ counting time interval corresponding to the same number of cycles of the received signal, the mean recurrence period of the successive interruptions, calculated on a predetermined whole number of periods, lower than the total number of periods of a complete transmission stage, being maintained constant and consequently independent from the variations of the distance from the ship to the bottom surface, until the end of the transmission stage, and deducing therefrom the distance travelled over by the vehicle.

3,781,775

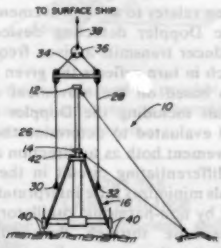
ROTATING STEREO SONAR MAPPING AND POSITIONING SYSTEM

Richard J. Malloy, Ojai, and Robert D. Hitchcock, Ventura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1972, Ser. No. 249,330

Int. Cl. G01s 9/66

U.S. Cl. 340—3 R 4 Claims



A stereo sonar system comprising a pair of pulsed sonar transducers mounted one above the other on a stationary bottom frame. The transducers are rotated as a unit but are spaced sufficiently to produce a three dimensional figure when stereo viewed.

3,781,776

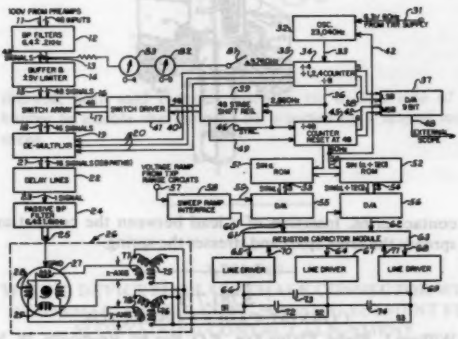
SOLID STATE HIGH SPEED SCANNING COMPENSATOR SWITCH FOR SONAR

Gerald D. Kuhn, Waldron; Kenneth A. Peterson; Eugene R. Roeschlein; Donald C. Weiss; Kenneth F. Weiss, and David L. Zeph, all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1972, Ser. No. 255,827

Int. Cl. G01s 9/68, 3/80

U.S. Cl. 340—3 R 8 Claims



A solid state high speed scanning compensator switch having a clock frequency source controlling a multiplicity of semiconductor switches in a prescribed manner to scan the outputs of hydrophones of a sonar receiver system by selecting a group of 16 adjacent outputs and to switch same into beam-forming delay lines, then steering the received beam in a rapid manner and passing the summed analog signals through a bandpass filter and at the same time providing scan synchronizing three-phase signals for producing a spiral sweep to provide sonar range and direction of a target on a display in relation to the hydrophone receivers.

3,781,777

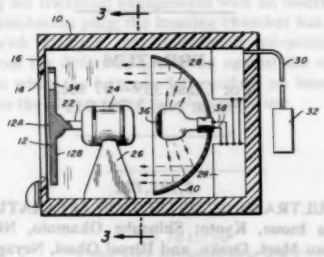
APPARATUS FOR PROVIDING AN INDICATION OF THE DEPTH OF OBJECTS IN WATER

Darrell J. Lowrance, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Continuation of Ser. No. 137,421, April 26, 1971, abandoned. This application Nov. 27, 1972, Ser. No. 309,685

Int. Cl. G01s 9/68, 9/70

U.S. Cl. 340—3 C 1 Claim



Apparatus for providing an indication of angular position in response to indicating signals including a disc rotated at a constant rate, the disc being opaque and having a light passing slot adjacent the periphery, a stationary circumferential scale positioned adjacent the periphery of the disc having indications thereon, and a light source positioned rearwardly of the disc and arranged to direct the light on the circumferential portion

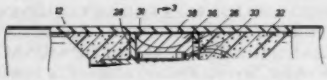
of the disc when energized by signals, a portion of the light passing through the slot in the disc.

3,781,778

MARINE STREAMER CABLE

Frederick C. Sawin, and William A. Whitfill, Jr., both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 19, 1972, Ser. No. 245,330
Int. Cl. G01v *1/16*
U.S. Cl. 340—7 R 12 Claims



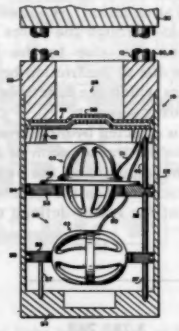
In accordance with an illustrative embodiment of the present invention, a marine streamer cable of layered solid construction includes a cable core with a stress member and electrical conductors extending eccentrically within a tubular flotation body. Seismic transducer assemblies are provided at spaced points along the cable with each assembly including a rigid case construction that houses a disc-type hydrophone to the side of the core and within the circumferential outline of the flotation body.

3,781,779

GAS IMPERMEABLE EXPANSION DIAPHRAGM

Charles V. Tallman, Rye Beach, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 10, 1971, Ser. No. 206,696
Int. Cl. H04b *13/00*
U.S. Cl. 340—8 R 8 Claims



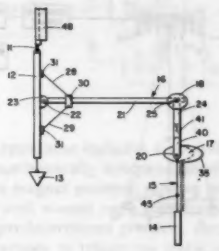
A hydrophone assembly for suspension below the surface of a body of water, the hydrophone assembly having a gas impervious diaphragm comprising a layer of elastomer material encapsulating a layer of metal for sealing a closed chamber which is filled with a gaseous evacuated liquid. The diaphragm compensates for changes in volume of the evacuated liquid which occurs with fluctuating temperatures and prevents any penetration of ambient air gases.

3,781,780

NEUTRALLY BUOYANT INSTRUMENT SUSPENSION

Willard Dow, Falmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 17, 1972, Ser. No. 272,707
Int. Cl. H04b *13/00*
U.S. Cl. 340—8 S 12 Claims



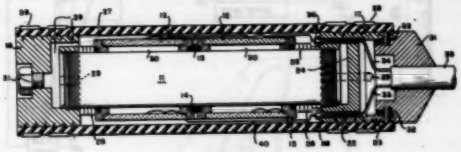
A hydrophone stabilizing device in which the hydrophone is maintained in neutral buoyancy and in a stabilized attitude during low speed tow and while tethered is provided. The hydrophone is suspended about the center of buoyancy of a major flotation member and is maintained in a stabilized attitude by the linkage of supporting arms which are selectively pivotable in the plane of the tow line. A smaller float is positioned at the intersection of the immediate vertical supporting arm and an intermediate arm or boom connecting the supporting arm to a vertical strut to assure that the point of intersection of the arms is always above the hydrophone.

3,781,781

PIEZOELECTRIC TRANSDUCER

Ivor D. Groves, Jr., Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 21, 1972, Ser. No. 273,911
Int. Cl. H04b *13/00*
U.S. Cl. 340—9 5 Claims

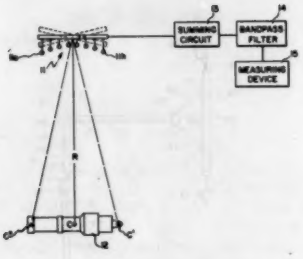


This disclosure relates to the novel construction of a single- or a multiple-element underwater sound transducer comprising one or more cylindrical, capped, piezoelectric ceramic elements (barium titanate, lead zirconate-titanate, or other material of similar properties) in a linear configuration. The structure results in acoustically decoupling each element from adjacent elements and from all of the supporting structure while retaining acoustic stability of the transducer over the broadest possible frequency range and with wide variation in temperature and hydrostatic pressure.

3,781,782
DIRECTIVE ACOUSTIC ARRAY FOR NOISE SOURCE LOCALIZATION

Paul F. Scott, Schenectady, N.Y.; Kenneth P. Radecki, Cincinnati, Ohio, and Robert B. Tatge, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,445
Int. Cl. G01s 3/80
U.S. Cl. 340—16 R **18 Claims**

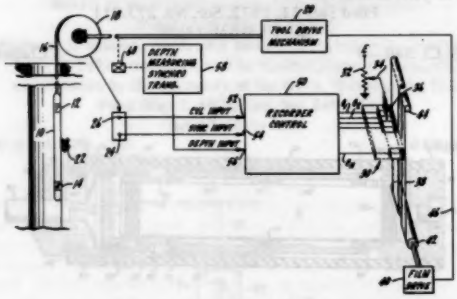


A highly directive, curved broadside array and method for its use to measure noise originating in a localized region of a complex extended noise source such as a jet engine. The array is mounted for scanning at a predetermined range distant from the source, and comprises a single row of microphones with a curvature conforming to the wavefronts of the spherical sound waves in the far field. The received signals are preferably summed, with shading if desired for increased side lobe suppresion, and bandpass filtered to extract broadband noise and pure tones. A technique for minimizing the number of microphones is given.

3,781,783
BOREHOLE LOGGING SYSTEM WITH IMPROVED DISPLAY AND RECORDING APPARATUS

Robert L. Tucker, Tulsa, Okla., assignor to Seismograph Service Corporation, Tulsa, Okla.

Filed Apr. 18, 1972, Ser. No. 245,110
Int. Cl. G01v 1/40
U.S. Cl. 340—18 DC **12 Claims**

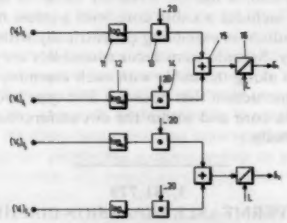


Improved borehole logging apparatus for use with a borehole tool obtaining a transmitter for periodically generating an acoustic signal at varying depths within a borehole and a receiver spaced from said transmitter for receiving the acoustic energy resulting from the generator acoustic signal. Signals respectively representing the acoustic energy generated by the transmitter, the acoustic energy detected by the receiver and the depth of the downhole tool are transmitted to an improved indicating and recording device which includes a series of light sources closely spaced in a linear array and sequentially illuminated by the received signals during the interval between successive transmitted signals so as to impress a linear trace across a recording medium which provides first and second dimensions of information corresponding respectively to the magnitude of the received acoustic energy and the arrival time of the acoustic energy with respect to the time of transmission of the corresponding acoustic signal. A third dimension of information results from the provision of means for advancing the recording medium perpendicular to the linear light source array as the depth of the downhole tool changes. A digital logic circuit controls the sequencing of the light sources and provides for the impression of vertical timing lines and horizontal depth lines on the medium by selective control of the signals applied to the respective light sources during each illumination sequence.

3,781,784
METHOD AND DEVICES FOR DETERMINING CHARACTERISTICS OF GEOLOGICAL FORMATIONS BY TRANSMISSION OF ACOUSTIC SIGNALS

Robert Desbrandes, Sevres, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil-Malmaison, France

Filed July 5, 1972, Ser. No. 269,051
Int. Cl. G01v 1/40
U.S. Cl. 340—15.5 AC **7 Claims**



A method wherein the attenuation of an acoustic wave between two receivers is expressed in the form

$$\delta = \delta_o + Af^{1/2} + Bf + Cf^2 + N_1 f^3 + N_2 f^4 + \ldots + N_f f^{n+2}$$

and wherein there is determined at least one of the coefficients δ_o (geometrical attenuation), A (attenuation due to the movements of the fluids through the pores of the geological formations), B (attenuation due to the friction between solids), C (attenuation due to the friction between fluids), N_1, $N_2 \ldots N_f$ (attenuations which are functions of the frequency of the transmitted acoustic signals).

This determination is effected by measuring different values of δ, corresponding to the transmission of different acoustic signals having different frequencies, the number of measurements performed at each level in the borehole being at least equal to the number of the above-defined coefficients to be determined.

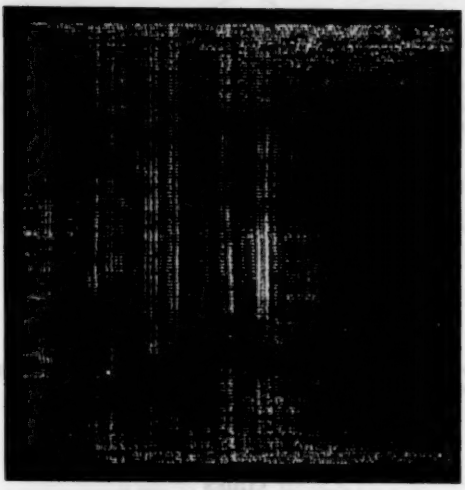
3,781,785
COLOR SONAGRAMS AND METHODS FOR THEIR PRODUCTION

Alfred H. Balch, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 26, 1970, Ser. No. 5,830
Int. Cl. G01v 1/34
U.S. Cl. 340—15.5 DS **17 Claims**

Seismographic signals are separated by filters into their low-, medium-, and high-frequency component signals and the en-

velope of each is generated and displayed in a different color, e.g., red, green, and blue, respectively. The displays are superimposed, and combined with the seismic trace so as to show both frequency content and time varying amplitude simultaneously.

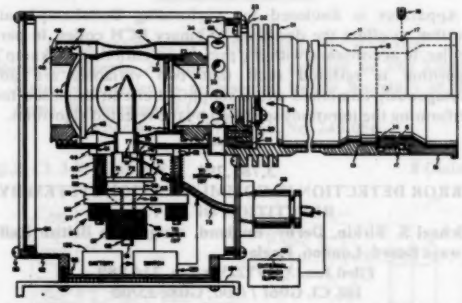


3,781,786

CODED TRACK MARKER LIGHT

Herbert Larrimore, Lynn Haven, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 5, 1972, Ser. No. 286,375
Int. Cl. G08g 3/00
U.S. Cl. 340—25 15 Claims



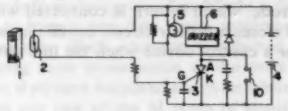
A track marker light is disclosed as having a housing and barrel containing a light source, an optical system for projecting the radiant energy from said light source as a beam along a predetermined course to be traversed by a ship. A unique relatively rotating reticle and optical filter system is mounted in front of said light source and within said optical system to encodingly turn on and off the light beam being projected from said barrel, so as to enable a navigator having decoding knowledge thereof to navigate said ship along a fine line transition zone at the center of said radiant energy beam.

3,781,787

TIRE PRESSURE DETECTING APPARATUS

Uichiro Sugiyama, 21-10, Zenpukuji-1-chome, Suginami-ku, Tokyo, Japan

Filed June 13, 1972, Ser. No. 262,260
Claims priority, application Japan, June 17, 1971, 46/43587
Int. Cl. B60c 23/02
U.S. Cl. 340—58 10 Claims



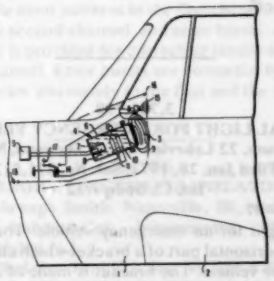
The detecting apparatus includes a rotatable bar-type permanent magnet mechanically independent of, but operatively associated with, a magnet position sensing member such as a reed switch or a coil wound on a magnetic core. When the magnet has one predetermined position, the position sensing device gates a thyristor to trigger an alarm which may be an audio alarm, a visual alarm, or both. The magnet is secured to the outer end of a shaft mounted in a casing which, in turn, is mounted through a wheel rim, and the inner portion of the shaft has a latching configuration. An externally accessible flexible shaft may be manually pressed to swing the magnet to a position in which it does not operate the magnetic sensing device and, in this position, the latching means on the shaft is engaged by one end of a spring biased rod. The other end of the spring biased rod is associated with a diaphragm subjected to the pressure of the air within the tire and the wheel rim so that, when the air pressure drops, the spring biased rod is retracted to release the shaft. A spring then rotates the shaft to swing the magnet into a position in which it is operative on the reed switch or the winding wound on the magnetic core. The flexible shaft for setting the magnet to the latching position may be operated by air pressure responsive to inflation of the tire.

3,781,788

VEHICLE LIQUID LEVEL MONITOR FOR PASSENGER PROTECTION INSTALLATIONS

Gerhard Schiesterl, Stuttgart, and Hans-Ulrich Kuhn, Hohenacker, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Mar. 24, 1972, Ser. No. 237,720
Claims priority, application Germany, Mar. 25, 1971, P 21 14 535.7
Int. Cl. B60r 21/00
U.S. Cl. 340—59 16 Claims



A passenger protection installation for vehicles, especially for motor vehicles, which includes at least one air bag that is adapted to be inflated when the vehicle exceeds a predeter-

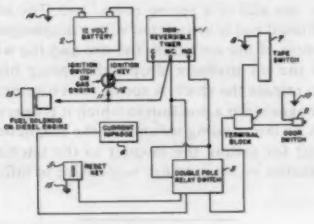
mined deceleration value, by means of a pressure gas that is developed from a liquefied gas within a pressure gas producer; the pressure gas producer includes a tank for the liquefied gas whereby at least one electrode is provided in the tank which, in relation to a predetermined minimum level of the liquefied gas in the tank, is electrically conductive with respect to the conductive liquefied gas only above this level and at least in its area directly adjacent thereto; when the tank is filled above its minimum level, the electrode is conductively connected by way of the liquefied gas with a connecting element, such as a second electrode, which in turn is connected with a shifting element that closes a further circuit containing an indicating device and/or a control device when the first circuit is interrupted.

3,781,789

ANTI-HIJACKING AND THEFT CONTROL SYSTEMS FOR MOTOR VEHICLES

Vincent J. Caleskie, Duxbury, Mass.; Paul T. Hughes, Dallas, Tex., and Robert Wayne Johnson, Minneapolis, Minn., assignors to Protection Devices, Inc., Dallas, Tex.

Filed July 7, 1972, Ser. No. 269,519
Int. Cl. B60r *25/04*
U.S. Cl. 340—64 **10 Claims**



An anti-hijacking and theft control system for use on motor vehicles including both gasoline engine and diesel engine types. A manually set non-reversible timer when set acts through a relay to disconnect the ignition or fuel solenoid when either a running board tape switch, a door switch, or other suitable switch are activated, and the motor vehicle will not run until the timer has completed its cycle. When the timer has completed its cycle, the motor vehicle returns to normal operation, and the system is inoperative. The system remains inoperative unless a reset is activated or the ignition key is turned off.

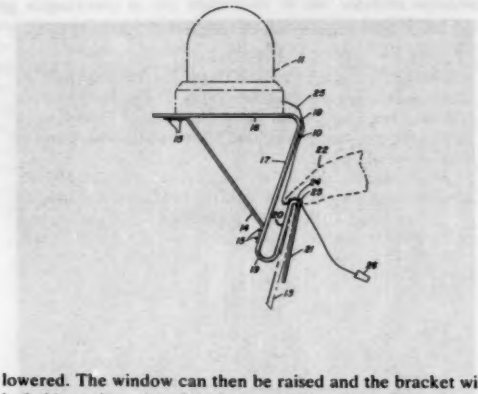
3,781,790

SIGNAL LIGHT FOR EMERGENCY VEHICLE

Peter G. Dawson, 22 Lakeview Ave., Lakewood, N.Y.

Filed Jan. 28, 1972, Ser. No. 221,512
Int. Cl. B60q *1/52*
U.S. Cl. 340—97 **1 Claim**

A signal light for an emergency vehicle. The light is supported on a horizontal part of a bracket which clamps onto the window of the vehicle. The bracket is made of a flat piece of resilient material, such as steel or relatively rigid plastic. It has a horizontal platform that supports the light and the material from the platform is bent downwardly and then bent back on itself upwardly then downwardly forming a space to receive the auto glass. A brace supports the platform to the vertically extending part of the bracket. Thus the bracket can be slipped over the window glass of an automobile when the window is



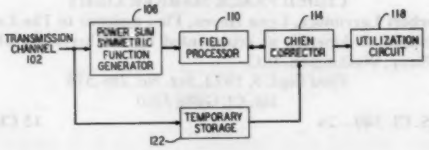
lowered. The window can then be raised and the bracket will be held snugly against the window and the window frame.

3,781,791

METHOD AND APPARATUS FOR DECODING BCH CODES

Daniel David Sullivan, Howell Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 13, 1971, Ser. No. 206,997
Int. Cl. H04l *1/10*; **H03k** *13/34*; **G08c** *25/04*
U.S. Cl. 340—146.1 AL **5 Claims**



Apparatus is disclosed for performing Berlekamp's algorithm to effect the decoding of binary BCH codes. In particular, in accordance with the present invention, Berlekamp's algorithm is restated such that two variables are advantageously combined and a simplified circuit disclosed for performing the iterations specified by the restated algorithm.

3,781,792

ERROR DETECTION IN COMMUNICATION SYSTEM BY REPETITION OF DATA

Michael S. Birkin, Derby, England, assignor to British Railways Board, London, England

Filed Jan. 3, 1972, Ser. No. 214,889
Int. Cl. G06f *11/00*; **G08c** *25/00*
U.S. Cl. 340—146.1 BA **6 Claims**

This invention relates to a communication system in which information is transmitted in the form of a continuously repeated digital sequence referred to as a 'message.' Each message is initially entered into a first register including a shift register whose outputs are energized in accordance with the digital sequence in the message, and each connected to one input of a bistable device. On reception of a second message in the sequence, the first message is passed to a second register, after an appropriate time delay, and the corresponding outputs of the second register are each connected to the second input of the corresponding bistable devices. Only if each message in the sequence is identical and both registers are

operating correctly will the bistables receive input pulses from each of the registers alternately to give what is effectively an alternating voltage output.

3,781,793

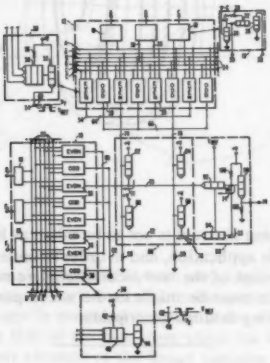
MONOLITHIC ARRAY ERROR DETECTION SYSTEM

Robert A. Henle, Port Chester; Irving T. Ho, Poughkeepsie; Teh-Sen Jen, and Gerald A. Maley, both of Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 101,629, Dec. 28, 1970, abandoned. This application Apr. 10, 1972, Ser. No. 242,318

Int. Cl. G06f *11/10;* **H03k** *13/34*

U.S. Cl. 340—146.1 AG **10 Claims**



An error detection system of n inputs is adaptable for fabrication in large scale integrated circuit form. An integrated circuit logic array provides a parity check in response to digital signals received via X and Y decoders. Reduction in the number of array cells and the X and Y driving decoder circuits is obtained by interconnecting even parity subgroups and odd parity subgroups of lines from the X and Y decoders to provide even master parity lines and odd master parity lines. A logic array having less than 2^n operative cells compares the signals on the master lines and generates an error parity signal.

3,781,794

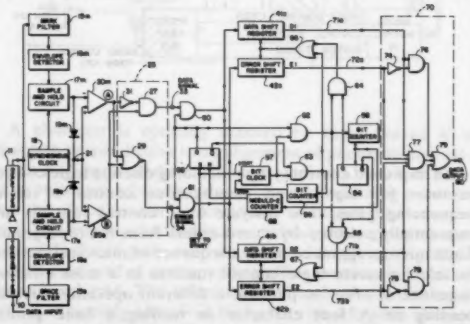
DATA DIVERSITY COMBINING TECHNIQUE

Derek S. Morris, Allenhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 18, 1972, Ser. No. 245,056

Int. Cl. G08c *25/00*

U.S. Cl. 340—146.1 R **8 Claims**



A data diversity combining technique for a system for data transmission of blocks of data each made up of a combination of M distinct and mutually exclusive types of signal elements occurring at a fixed rate, characterized in that an error indication signal is produced during any data signaling element interval during which the detection circuitry is incapable owing to noise, fading or other signal perturbation, to determine which of the M types of signal elements is present during the signaling element interval. The same data block is transmitted two or more times with each transmitted data block being stored separately, and the signaling elements and accompanying error signals from the various data blocks is combined in a logic circuit to form a new data block consisting of selected signaling elements. Each element is selected from those received during each transmission as the ones with no indicated error; if all have indicated errors an arbitrary choice is made so that any one of the M types of signal elements is selected whenever error signals are associated with all blocks of data.

3,781,795

ERROR-CORRECTING DATA TRANSMISSION SYSTEM

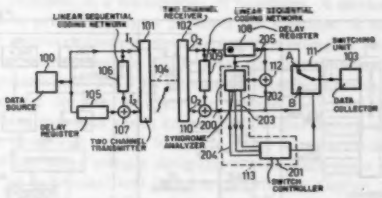
Leo Eduard Zegers, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,429

Claims priority, application Netherlands, May 18, 1971, 7106776

Int. Cl. G06f *11/08*

U.S. Cl. 340—146.1 BE **3 Claims**



An error-correcting data transmission system in which two versions of the same data are transmitted from a transmitter station to a receiver station via two channels having a mutual time difference, and in which a coded version of the non-delayed data is added to the delayed data before transmission as well as after reception. At the receiver side a syndrome signal is calculated by adding, after a corresponding delay, the non-delayed data to the delayed data. The syndrome signal is applied to a syndrome analyzer which makes a distinction between simple error patterns in the first channel, simple error patterns in the second channel, and error bursts. An error correction circuit is provided for correcting simple error patterns in the first channel. Error bursts are corrected by connecting the data collector alternately to the first and the second channel.

3,781,796

ERROR DETECTING TRANSLATOR

Nicholas Kimbrough Smith, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

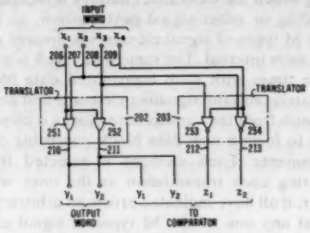
Filed Oct. 16, 1972, Ser. No. 297,670

Int. Cl. G06f *11/00;* **H03k** *13/32*

U.S. Cl. 340—146.1 AB **3 Claims**

A signal translation circuit arrangement comprises two translators that operate according to different rules of action. The translators respond to each valid input signal representation by forming identical corresponding output signal

representations and the translators respond to each invalid input signal representation by forming nonidentical output



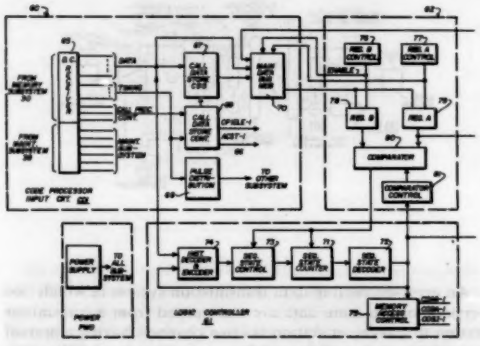
signal representations. Invalid input signal representations and circuit malfunctions are detected by comparing the output signals generated by the translators.

3,781,797

CODE PROCESSOR OUTPUT BUFFER VERIFY CHECK

William Jinbo, Skokie, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 2, 1973, Ser. No. 320,360
Int. Cl. G06f *11/00;* **G08c** *25/00*
U.S. Cl. 340—146.1 R **4 Claims**



An arrangement for verifying the content of an output buffer in a system including a first register which, during an initial memory word search, is used to compare with a second register to find a proper translation memory word. During the verify mode, the first register, via a verify bus, takes data loaded to the output buffer and compares the content with the data in the second register.

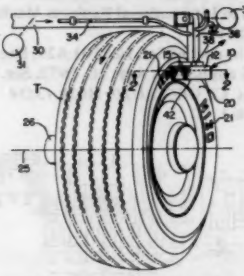
3,781,798

MECHANICAL READING OF TIRE IDENTIFICATION SYMBOLS

William L. Hinks, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 20, 1971, Ser. No. 209,610
Int. Cl. G06k *7/04*
U.S. Cl. 340—146.3 R **11 Claims**

Method and apparatus for mechanically reading alpha numeric symbols in the identification code of a pneumatic tire. The apparatus includes a plurality of closely spaced individually movable fingers urged by air pressure toward the surface of a tire on which such symbols are placed. Upon relative movement between the tire surface and the fingers, the individual fingers are deflected by the local topography of the symbols. The deflections are transduced by linear differential transformers connected individually to the fingers and produce deviation signals which can be communicated to conventional character recognition equipment for indication, display, or recording.



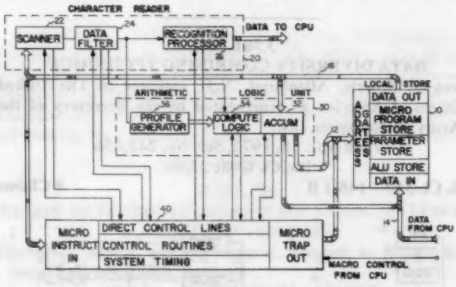
The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

3,781,799

CONTROL SYSTEM EMPLOYING MICROPROGRAM DISCRETE LOGIC CONTROL ROUTINES

Thomas Scott Robinson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,046
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 MA **9 Claims**



An improved control system including discrete logic control routines for high speed simultaneous control of many sequencing gates. The discrete logic control routines are sequentially selected by micro-orders from microporgrams. Each microprogram contains a sequence of microinstructions to select discrete logic control routines in a most efficient sequence in order to perform a different operation such as reading an A font character or reading a hand printer character. The selection between different microprograms is accomplished by macroinstructions from a controlling computer.

3,781,800

DEVICE FOR CHARACTER RECOGNITION

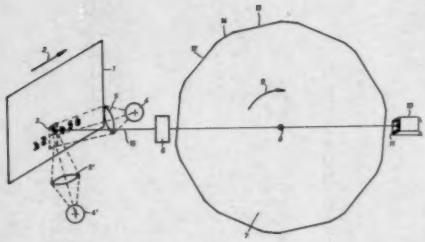
Bernhard Cramer, Pforzheim; Herbert Domig, Niefern; Theodor Von Keller, Rutesheim, and Rudolf Schmeykal, Pforzheim, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 20, 1972, Ser. No. 264,667

Claims priority, application Germany, July 19, 1971, P 21 36 044.1

Int. Cl. G06k 9/00

U.S. Cl. 340—146.3 F 3 Claims



A transparent polygonal disk with parallel side surfaces has an axis of rotation which is parallel to the record medium. The recognition logic is provided by glass fibers which are positioned on the side of the disk from which the light emerges. Each character element of the image contains a plurality of fibers.

3,781,801

PROCESS FOR OPTICAL RECOGNITION OF CHARACTERS

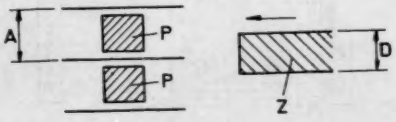
Max Anderegg, Egg, Switzerland, assignor to Turlabor AG., Zumikon, Switzerland

Filed Nov. 10, 1971, Ser. No. 197,333

Claims priority, application Switzerland, Nov. 13, 1970, 16832/70

Int. Cl. G06k 9/12

U.S. Cl. 340—146.3 MA 1 Claim



A character is optically scanned by being moved in a direction perpendicular to an alignment of photosensitive elements such as photodiodes. The photodiodes, to which sampling pulses are applied produce successive scanning pulses so that the character can be considered as divided into a matrix grid. The information within the matrix grid is grouped into several displaced grids, each displaced grid representing information produced at corresponding offset locations in a cell of the original grid. The information of each of the displaced grids is separately compared bit by bit with reference characters to ascertain conformity to the greatest degree to establish identity of the character which has been scanned.

3,781,802

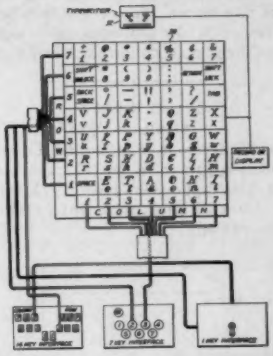
METHOD OF COMMUNICATION AND/OR TESTING OF THE HANDICAPPED

Haig Kafafian, 4201 Cathedral Ave., N.W., Washington, D.C.

Filed Mar. 27, 1972, Ser. No. 238,319

Int. Cl. B41j 5/10

U.S. Cl. 340—147 R 16 Claims



Three different classes of interface means are connectable to a dual-input matrix or converter, which in turn will operate a device for purposes of communication and/or indicate student capabilities.

A unique combination of designators is established for every function in a multiplicity of functions. A device is provided to print, display or perform the function. A matrix or other means transmits signals to the printing or displaying device commensurate with the unique combination of designators selected. Three classes of interfaces are selectively connected to the matrix, one having two sets of input switching means of seven keys each, another having one set of seven keys, and a third having a single input transducer. By use of the same unique designators with each class of interface, an individual will be able to print or display the very same function, regardless of the class of interface used.

3,781,803

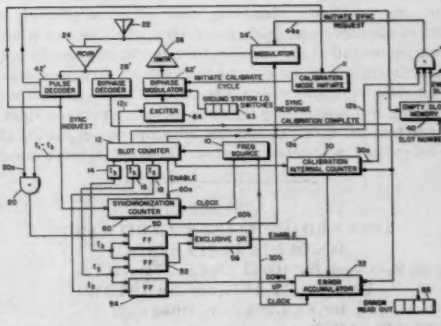
COLLISION AVOIDANCE SYSTEM GROUND STATION SYNCHRONIZATION

Wayne G. Shear; Brendan J. Spratt, both of Pompano Beach, and Benton J. McClure, Lighthouse Point, all of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 10, 1972, Ser. No. 242,631

Int. Cl. H04l 7/08

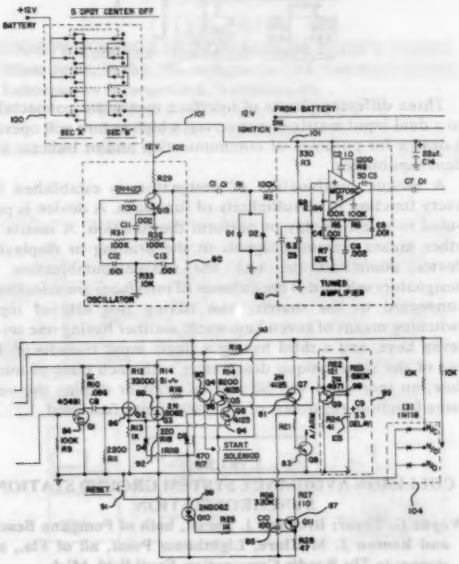
U.S. Cl. 340—147 SY 4 Claims



A collision avoidance system ground station has its clock phase synchronized with a master clock through the use of a

line-of-sight radio link. Multiple two-way synchronization rangings are exchanged between the ground station and the master clock. A digital counter at the ground station obtains the average deviation of the ground station clock with respect to the master clock and applies this average deviation to calibrate or synchronize the ground station clock with the master clock. Subsequently, further multiple two-way synchronization rangings are exchanged between the ground station clock and the master clock. A digital counter at the master clock now obtains the average deviation of the master clock with respect to the ground station clock as a check of the validity of the ground station clock calibration.

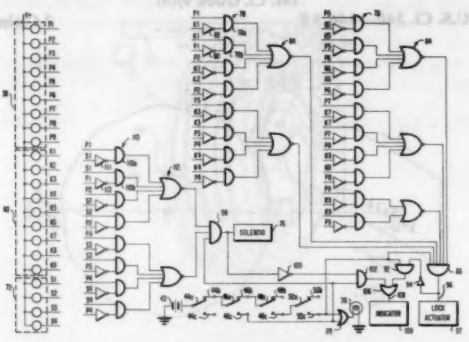
3,781,804
ALARM SYSTEM
Milton Ronald Lederer, Jr., P.O. Box 63, Lititz, Pa.
Continuation-in-part of Ser. No. 122,614, March 1, 1971, abandoned. This application June 5, 1972, Ser. No. 259,655
Int. Cl. G05b *1/00*; **H01h** *47/00*
U.S. Cl. 340—147 MD **10 Claims**



The disclosure relates to an alarm system wherein a key operated settable switch bank is provided as a part of a circuit which includes a circuit capable of operating in two conditions, one condition indicating that all of a plurality of switches have been properly positioned, the other condition indicating that all of the switches have not been properly positioned. Operation of the key closes a switch which provides an output after a predetermined time delay. If the switches are all properly positioned during the delay period, a power output is provided. If the switches are not all properly set during the predetermined time delay period, an alarm signal is provided.

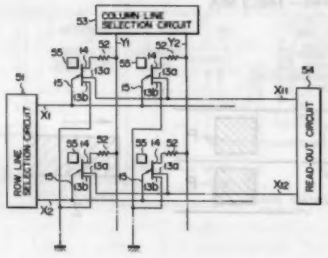
3,781,805
KEY CARD OPERATED SECURITY AND ACCOUNTABILITY SYSTEM
Charles R. O'Neal, Jr., 10043 52nd St., Tampa, Fla.
Filed Nov. 12, 1971, Ser. No. 198,333
Int. Cl. G06k *7/06*; **H04q** *9/00*
U.S. Cl. 340—149 R **11 Claims**

A logic controlled security and accountability system. An area to be secured is locked by an electrically actuated lock. A coded program card is inserted into the lock control apparatus and programs it to respond only to a predetermined code. When an authorized person desires access, he inserts into the lock control apparatus a key card coded with that predetermined code to cause an actuating signal to be applied to the lock. The program and key cards can be made of an inexpensive material and coded individually for each successive guest,



and so if the system is installed in a hotel, for example, no loss is experienced and security is not jeopardized should a guest fail to return his key card when he checks out. Additionally, in a hotel or similar facility utilizing the system in conjunction with a computerized billing system, once a guest has inserted his program card into the lock control apparatus associated with his room, his key card can be used in shops within the hotel to charge purchases to the account of his room.

3,781,806
SEMICONDUCTOR SWITCHING ELEMENT AND A SEMICONDUCTOR SWITCHING INVOLVING THE SAME
Yoshihiko Mizushima, and Isoneta Sudo, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan
Division of Ser. No. 885,388, Dec. 15, 1969, Pat. No. 3,657,616. This application Jan. 24, 1972, Ser. No. 220,534
Int. Cl. H01j *39/12*; **H01l** *11/14*; **H04q** *9/00*
U.S. Cl. 340—166 R **13 Claims**



A semiconductor switching element and a semiconductor switching device involving the same which comprise at least one collector region diffused in a semiconductor substrate from its surface, containing a high concentration of impurities having the same type of conductivity as said substrate and displaying a higher degree of said conductivity than said substrate and formed into a fully narrow area, a base region diffused at a space of approximately 50 microns max. from said collector region, as measured from the same surface of said semiconductor substrate as that on which there is formed said collector region, in a manner to make the edge of said base re-

gion facing said collector region sufficiently longer than that of said collector region and containing a high concentration of impurities having the same type of conductivity as said semiconductor substrate and displaying a higher degree of said conductivity than said semiconductor substrate and at least one emitter region diffused from the same surface of said semiconductor substrate as that through which the aforesaid two regions are diffused and having an opposite type of conductivity to said semiconductor substrate.

3,781,807

STORED PROGRAM ELECTRONIC COMPUTER USING MACROINSTRUCTIONS

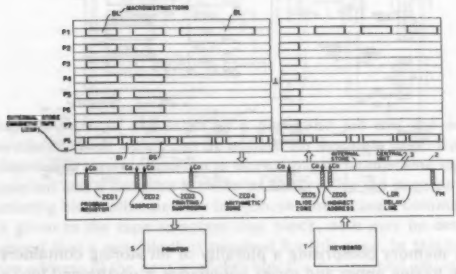
Fabrizio Saltini, Modena, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Filed Dec. 31, 1969, Ser. No. 889,570

Claims priority, application Italy, Jan. 20, 1969, 50206 A/69

Int. Cl. G06f *13/00*

U.S. Cl. 340—172.5 **2 Claims**



A computer for executing a program made up of a series of macroinstructions each including a plurality of instructions grouped in a fixed order and haVing a serial operational memory the computer, comprising means for interpreting the instructions of a macroinstruction stored in a predetermined portion of the operational memory. Furthermore the computer comprises means responsive to the interpretatation by said interpreting means of a predetermined instruction in the macroinstruction stored in said predetermined portion of the operational memory for causing the interpreting means to commence interpreting the information stored in a selected portion of said memory as a series of macroinstructions. Additional means are connected to the operational memory for executing the series of macro-instructions serially in response to the determined instruction.

3,781,808

VIRTUAL MEMORY SYSTEM

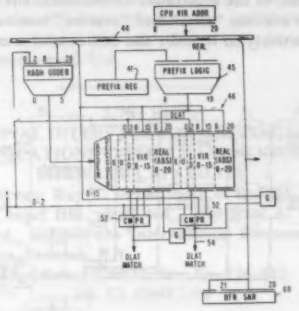
Thomas P. Ahearn, Poughkeepsie; Robert S. Capowski, Verbank; Neal T. Christensen, Poughkeepsie; Patrick M. Gannon, Poughkeepsie; Arlin E. Lee, Poughkeepsie, and John S. Liptay, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1972, Ser. No. 298,190

Int. Cl. G06f *13/00*; G11c *9/00*

U.S. Cl. 340—172.5 **4 Claims**

This specification describes a virtual memory system in which a set of conversion tables is used to translate an arbitrarily assigned programming designation called a virtual address into an actual main memory location called a real address. To avoid the necessity of translating the same addresses over and over again, a table called the Directory Look Aside Table (DLAT) retains current virtual to real address translations for use where particular virtual addresses are requested more than once. Each translation retained by the DLAT is identified by an identifier (ID) that signifies the set of tables used in that translation. This identifier is compared with an identifier generated for the currently requested virtual address. If these identifiers match and the virtual address



retained in the DLAT matches the currently requested virtual address, the translation stored in the DLAT may be used. If the identifiers or virtual address don't match, a new translation must be performed using the set of conversion tables associated with the currently requested address.

3,781,809

RETRIEVAL METHOD IN READING DICTIONARIES

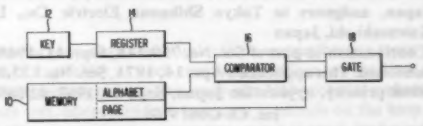
Makoto Murakoshi; Shingo Ooue; Hiroyuki Ueda; Masakazu Hashiue, and Hirotoshi Endo, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1970, Ser. No. 66,952

Claims priority, application Japan, Aug. 27, 1969, 44/67796

Int. Cl. G06f *15/02*, *15/40*

U.S. Cl. 340—172.5 **2 Claims**



A method for retrieving words from a dictionary in which one word representative of each page of the dictionary is stored in a memory. A desired word is compared with the stored words and as a result of the comparison the page on which the desired word is printed is displayed on an optical display device. The representative word may be the last word on a page, an imaginary word between the last word on the page and the first word on the next page, or any other word which is representative of a page.

3,781,810

SCHEME FOR SAVING AND RESTORING REGISTER CONTENTS IN A DATA PROCESSOR

Randall William Downing, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

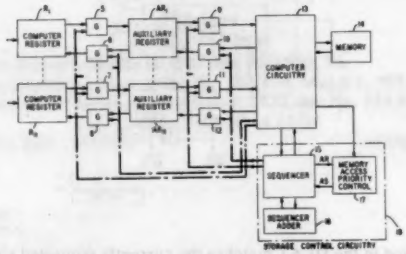
Filed Apr. 26, 1972, Ser. No. 247,727

Int. Cl. G06f *9/12*

U.S. Cl. 340—172.5 **4 Claims**

A program controlled computer which comprises independent control circuitry for exchanging data between registers of the computer and the computer memory independently of the

execution of program. This arrangement saves computer time as it facilitates the storing and retrieving of data which must be saved during nesting and unnesting of program transfers. For each register that contains data which is to be saved upon the occurrence of a program interrupt, there is provided an auxiliary register and program controlled gates for exchanging data between the computer register and its corresponding auxiliary register. In the illustrative embodiment the computer is arranged to execute "save" and "restore" instructions which serve respectively to transfer the contents of a computer register to its auxiliary register and to transfer the contents of an auxiliary register to its associated computer register. The independent control circuitry monitors the busy and idle states of the computer memory and upon occurrence of periods of time in which the computer is not utilizing the computer memory, the independent control circuitry exchanges data between the auxiliary registers and the computer memory. Data is exchanged between the computer registers and their associated auxiliary registers simultaneously. However, data is exchanged between the auxiliary registers and the computer memory on a word-by-word serial basis.

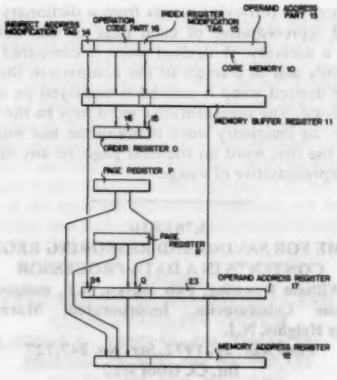


3,781,811

MEMORY PROTECTIVE SYSTEMS FOR COMPUTERS

Akio Yakata, Kawasaki, and Tsuneo Kinoshita, Ohme, both of Japan, assignors to Tokyo Shibauna Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 759,146, Sept. 11, 1968, abandoned. This application Apr. 14, 1971, Ser. No. 133,983
Claims priority, application Japan, Sept. 14, 1967, 42/58968
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 **8 Claims**



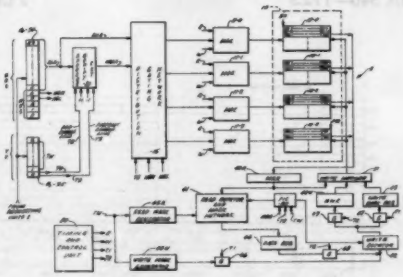
In a memory protective system for computers operable under master and slave modes which has a first register (denoted as a P register) storing information conducive to the determinatisn of an execution address of said master mode and a second register (denoted as a R register) storing information conducive to the determination of an execution address of said slave mode, the improvement comprising means for switching said second register to said first register when an information for changing the contents of said memory appears under said slave mode.

3,781,812

ADDRESSING SYSTEM RESPONSIVE TO A TRANSFER VECTOR FOR ACCESSING A MEMORY

Charles E. Wymore, and Clayton P. Dahlberg, both of Santa Barbara, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed June 28, 1971, Ser. No. 157,307
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 **11 Claims**



A memory comprising a plurality of bit storing containers each having upper and lower boundaries is partitioned into a plurality of modules. The containers in each module are arranged in a plurality of locations. Fields of data bits can be stored partly in one module and partly in another module and can thereby extend across the boundary between modules. Each module is coupled to its own access control means. During a memory access, each access control means receives an absolute address signal, responds thereto to select a location in its associated module; all the containers in the selected location are accessed; and data bits are transferred between a data register and a selected group of the accessed containers. The absolute addresses are derived from a bit boundary address and a transfer vector. The bit boundary address comprises a field of encoded signals which field has a length sufficiently long to specify an arbitrary boundary in the memory. A subfield of the bit boundary address is selectively modified by address modifying circuitry so as to produce the absolute addresses. The transfer vector comprises a transfer sign field and a transfer width field. The transfer sign field indicates which side of a specified boundary has the containers involved in the data transfer. The transfer width field indicates the number of bit containers involved in the data transfer. Circuitry coupling the memory to the data register provides rotation and masking so that the contents of accessed containers which are not involved in the data transfer do not affect the data transfer or change as a result thereof.

3,781,813

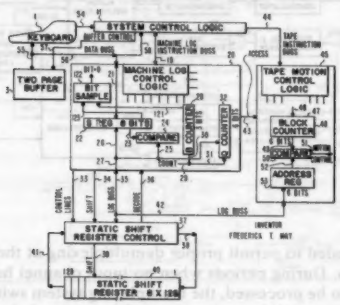
MACHINE LOG SYSTEM

Frederick T. May, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,346
Int. Cl. G06f 3/12
U.S. Cl. 340—172.5 **7 Claims**

A typewriter is electronically connected to a multi-page buffer which is a dynamic electronic shift register. System control logic is provided to allow the operator to type codes

corresponding to characters as well as certain control codes into the buffer for later print-out. In addition, the system control logic is operable to allow the operator to insert characters into and delete characters from the buffer for editing and correction purposes. The multi-page buffer is also in electronic association with a tape cassette such that the operator, by depressing a page store button, can store the contents of the buffer onto the tape of the tape cassette or read pages from the tape into the buffer. Means are provided for automatically keeping track of the location of the pages of the various jobs. Thus, a machine log is utilized which is recorded at the beginning of the cassette tape which includes the location on



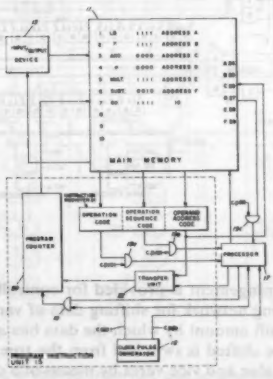
tape of each of the pages of a particular job and the next available block which can be utilized for storing a page. Upon depressing the store button to store a page, the machine log is queried and a decision is made to either store the page on an existing block allocated for this job, in which case a command is given to the tape to access that block, or it may be determined that a new block is required for this page. In this case the address of the next available block is determined and is inserted in the machine log static shift register (SSR) and the cassette is automatically driven to that block. At the beginning of a recording operation the machine log stored on the tape is loaded into an electronic static shift register (SSR) under control of the system control logic.

3,781,814

METHOD AND APPARATUS FOR APPLYING SOURCE LANGUAGE STATEMENTS TO A DIGITAL COMPUTER

Alan J. Deerfield, Newtonville, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 7, 1971, Ser. No. 187,242
Int. Cl. G06f *9/06*
U.S. Cl. 340—172.5 **2 Claims**



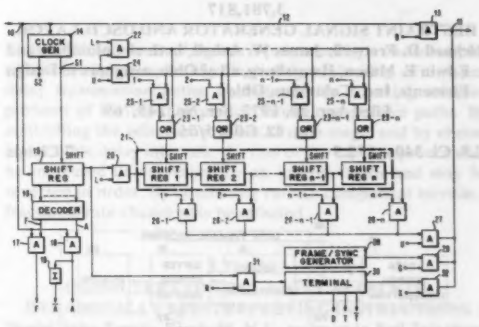
A method of operating a general purpose computer which uses instruction words, each containing, in addition to an operation code and an operand address code, an operation sequence code and an improved processor adapted to the contemplated method is shown. The operation sequence code in each instruction word is read out of memory as a program counter is sequenced so that the processor may be caused to defer the operation called for by the instruction word until such operation may properly be executed. In addition, the processor may be controlled so that deferral may be effected whenever the hierarchal precedence of an operation to be performed dictates that the next following operation in a sequence be performed first.

3,781,815

TERMINAL INTERFACE FOR A SERIAL LOOP COMMUNICATIONS SYSTEM HAVING STORE AND FORWARD CAPABILITY

Paul E. Boudreau; Roy C. Dixon, both of Raleigh; Robert A. Donnan, Chapel Hill, all of N.C., and Eual A. Moss, Fort Wayne, Ind., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 15, 1972, Ser. No. 226,443
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **5 Claims**



A serial loop data communications system having store and forward capability at each terminal interface on the loop and in which data signal entities, each of which includes a plurality of data bits, addressed to subsequent terminals on the loop are stored in successive locations in a serial storage device when received if a terminal associated with the interface is transmitting. At the termination of data transmission by the associated terminal, the previously stored data signal entities are forwarded from the data entity storage position occupied by the oldest received entity and subsequently received entities are advanced to successive entity storage positions until data signal entities for subsequent terminals on the loop are no longer received, at which time advancement of the date signal entities is terminated and the data signal entities then remaining in storage, are forwarded from the successive entity storage locations in the serial storage in the order of receipt.

3,781,816

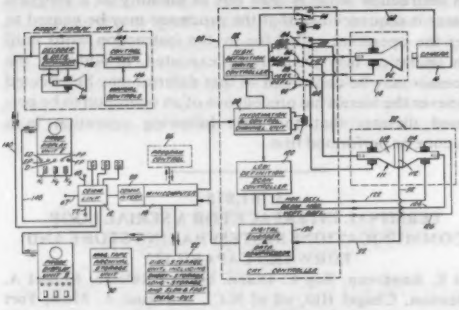
AUTOMATIC PUBLICATIONS SYSTEMS AND METHOD

Aaron H. Coleman, Levittown, Pa., and Hugh W. Stewart, Princeton, N.J., assignors to CPS Associates, Inc., Croydon, Pa.

Filed Apr. 10, 1972, Ser. No. 242,409
Int. Cl. G06f *3/14*; G06k *15/00*
U.S. Cl. 340—172.5 **23 Claims**

An electronic photo-typesetting system employing a central computer-controlled electronic photo-typesetter and a plurality of remote publications-data input terminals. Final page proof is supplied substantially instantaneously to any

requesting remote terminal by means of a scan converter at the central station, which supplies a proof-display device at



the requesting terminal with electrical signals of relatively narrow bandwidth representing a lower-definition proof grade image of the final composed page.

3,781,817

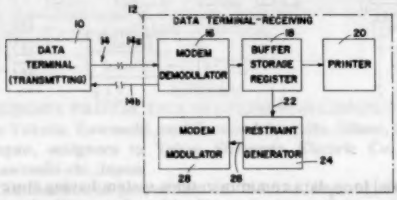
RESTRAINT SIGNAL GENERATOR AND OSCILLATOR

Richard D. Fretwell; James W. Azbell, both of Columbus, and Edwin E. Mason, Harrisburg, all of Ohio, assignors to Design Elements, Inc., Columbus, Ohio

Filed Apr. 20, 1972, Ser. No. 245,769

Int. Cl. G06f *5/06*

U.S. Cl. 340—172.5 **7 Claims**



A circuit for use with a data terminal, including a data modulator and a buffer, for generating a signal which restrains the transmission of incoming data when the buffer is full. The generator has a square wave oscillator comprising a high gain differential comparator with a resistive feedback network connected to its non-inverting input and a series pair of resistors connected between its output and its inverting input. A capacitance is connected between the common node of the series pair and a dc supply. The oscillator is inhibited by a dc signal applied through a diode to the comparator's inverting input when the buffer is not full but is effectively freed to oscillate when the buffer is full to apply a modulating restraint signal input to the modem's modulator.

3,781,818

DATA BLOCK MULTIPLEXING SYSTEM

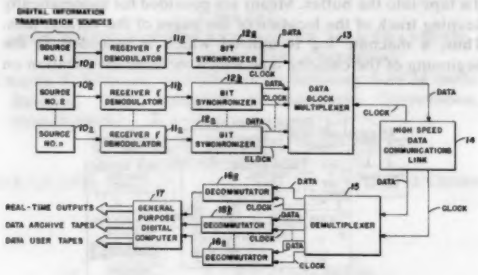
Carroll T. Pardoe, Woodbine; Alvar G. Carlton, Silver Spring, and Robert L. Appel, Rockville, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed May 8, 1972, Ser. No. 250,901

Int. Cl. H04j *3/16*

U.S. Cl. 340—172.5 **40 Claims**

A time-division multiplexing system capable of combining the asynchronous data bit streams from a plurality of independent input data sources and outputting the data as a single, higher rate bit stream is disclosed. The data from each input source is temporarily stored at its own clock rate until a block of data comprising a predetermined number of bits becomes available for a particular input source. When this occurs, the data is outputted, as a block, with a source identifying code



label appended to permit proper demultiplexing at the reception station. During periods when no input channel has sufficient data to be processed, the multiplexing system switches to an operating condition wherein useful overhead data; e.g., coding check bits or low priority data, are outputted.

3,781,819

SHIFT UNIT FOR VARIABLE DATA WIDTHS

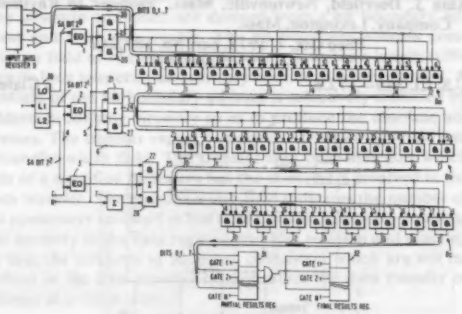
Hellmuth R. Geng, Schoenaich; Johann Hajdu, Boeblingen, and Petar Skuin, Magstadt, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1972, Ser. No. 253,084

Claims priority, application Germany, Oct. 8, 1971, P 21 50 291.0

Int. Cl. G06f *5/00*

U.S. Cl. 340—172.5 **10 Claims**

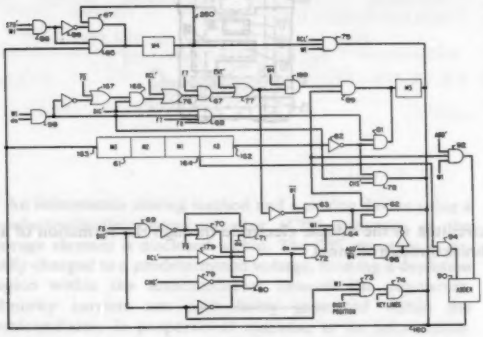


A circuit arrangement is provided for controlling a known logical switching network for shifting data of variable widths, wherein the shift amount by which the data bits applied to the input are to be shifted is switched from the true value to the complement value and vice versa by means of a control signal influenced by control commands, and wherein the partial results thus produced are logically combined to form a further partial result or the final result.

3,781,820
PORTABLE ELECTRONIC CALCULATOR

David S. Cochran, Palo Alto, and Thomas E. Osborne, San Francisco, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 30, 1972, Ser. No. 257,606
Int. Cl. G06f 3/02
U.S. Cl. 340—172.5 14 Claims

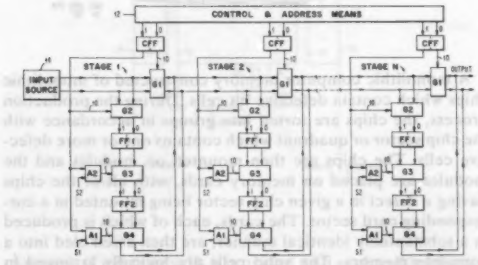


An electronic calculator is provided with an enter key, a change sign and a store key. The enter key causes a stack memory to be pushed down, duplicating information from a keyboard register into a first memory register. The first data key actuated after the enter key causes the keyboard register to be cleared before the new data is entered into that register. The change sign key operates in conjunction with a keyboard register of the main stack memory to change the sign of a number contained therein. If this key is actuated subsequent to the performance of a function and data is entered after the key is actuated, then the sign of the new entry will be changed rather than the sign of the previous contents of the keyboard register. The store key causes information in the keyboard register to be duplicated into an auxiliary memory. The first data key actuated after the store key causes the keyboard register to be cleared before the new data is entered.

3,781,821
SELECTIVE SHIFT REGISTER

Robert Ingersoll Roth, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1972, Ser. No. 258,963
Int. Cl. G11c 19/00
U.S. Cl. 340—172.5 7 Claims

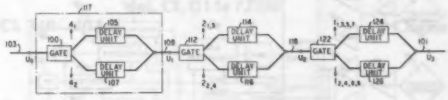


Information is shifted from any one or a number of stages in a shift register to any other one or other stages of a shift register by use of gating circuits connected to each stage operated by a control circuit. The gating circuits connected to each stage of the register are operative to either inhibit storage of input information therein and transfer of stored information by stage disconnect while allowing immediate passage of such information to the next succeeding stage by immediate transfer connect, or to allow storage of input information therein and transfer of stored information by stage connect while inhibiting immediate passage of such information to the next succeeding stage by immediate transfer disconnect.

3,781,822
DATA RATE-CHANGING AND REORDERING CIRCUITS

Syed Vickar Ahamed, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 9, 1972, Ser. No. 279,020
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 7 Claims

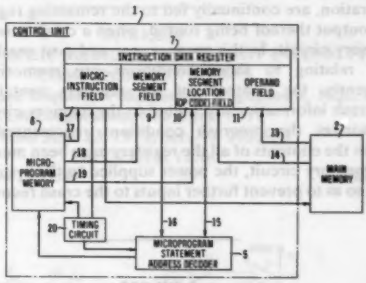


An input sequence of signals is processed by a cascaded plurality of stages, each stage including a plurality of unequal delay transmission paths, and means for directing selected portions of the input sequence through respective paths. By controlling the selection process at each stage, and by choosing suitable delay intervals, the rate of the input sequence may be increased or decreased by an integer factor and may be reversed in order. By combining various component circuits a fractional rate change may be effected.

3,781,823
COMPUTER CONTROL UNIT CAPABLE OF DYNAMICALLY REINTERPRETING INSTRUCTIONS

Daniel John Senese, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1972, Ser. No. 276,116
Int. Cl. G06f 1/00
U.S. Cl. 340—172.5 5 Claims



A microprogrammed computer is disclosed in which two sets of microprograms, each set containing a microprogram to execute each program instruction, are stored in microprogram memory. A selected program instruction is provided which, when executed, changes the set of microprograms from which particular microprograms are selected to execute subsequent program instructions. Insofar as the microprograms comprising the newly selected set of microprograms differ, in general, from the corresponding microprograms comprising the previ-

ously selected set, the execution characteristics of subsequent program instructions executed by microprograms in the newly selected set are changed.

3,781,824

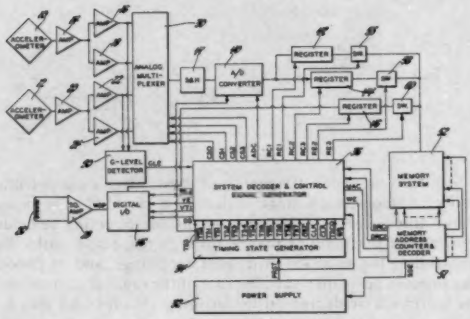
SOLID STATE CRASH RECORDER

Frank P. Caiati, Bloomfield Hills, and David C. Wight, Romeo, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 249,918, May 3, 1972. This application Nov. 20, 1972, Ser. No. 308,005

Int. Cl. G11c *19/00*

U.S. Cl. 340—172.5 **3 Claims**



A solid state crash recorder in which various vehicle conditions such as acceleration and speed are continually monitored and converted into digital form with the magnitude of the conditions monitored being cyclically stored in a plurality of registers. Upon the sensing of a crash, the contents of a portion of the registers corresponding to certain vehicle conditions, such as speed and low level acceleration, are maintained so as to provide information relating to precrash conditions while information relating to other conditions, such as high acceleration, are continually fed to the remaining registers with the output thereof being routed, when a crash is sensed, to a memory circuit. In this manner, pre and post crash information relating to those conditions are memorized. Subsequently, the contents of the registers containing only precrash information are routed to the memory circuit which memorizes the precrash conditions represented thereby. When the contents of all the registers have been memorized in the memory circuit, the power supplied to the system is disabled so as to prevent further inputs to the crash recorder.

3,781,825

PROGRAMMABLE FIXED DATA MEMORY UTILIZING SCHOTTKY DIODES

Ulf Burker, and Sigurd Koch, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

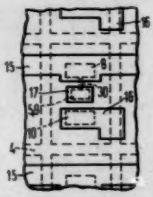
Filed May 10, 1971, Ser. No. 141,725

Claims priority, application Germany, May 12, 1970, P 20 23 219.3

Int. Cl. G11c *7/00, 11/34, 17/00*

U.S. Cl. 340—173 SP **9 Claims**

A memory element comprises two series-connected and series-opposed Schottky diodes. A middle electrode is provided between the Schottky diodes. To effect programming, the Schottky diode which is operated at reverse voltage is short-circuited to the middle electrode through the formation of a breakthrough channel.



3,781,826

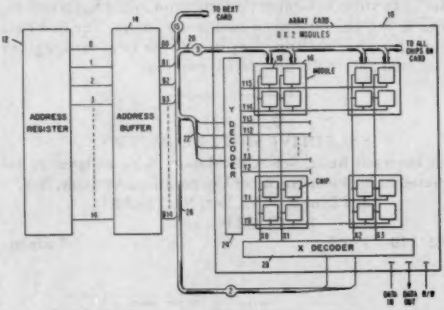
MONOLITHIC MEMORY UTILIZING DEFECTIVE STORAGE CELLS

William Francis Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 76,917, Sept. 30, 1970. This application Nov. 15, 1971, Ser. No. 198,869

Int. Cl. G11c *11/40, 15/00*

U.S. Cl. 340—173 R **8 Claims**

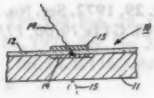


A monolithic computer memory constructed of monolithic chips which contain defective bit cells. During the production process, the chips are sorted into groups in accordance with the chip sector or quadrant which contains one or more defective cells. The chips are then mounted on modules and the modules are placed on memory cards, with all of the chips having a defect in a given chip sector being mounted in a corresponding card sector. The cards, each of which is produced in a substantially identical manner, are then assembled into a complete memory. The valid cells are logically arranged in contiguous address locations by transformation logic which converts the address before it is presented to the memory bit cards. Addresses presented to the logic are re-ordered such that all addresses that, untranslated, would have selected a defective area of a chip, after being translated select a non-defective area of a chip.

3,781,827
DEVICE FOR STORING INFORMATION AND PROVIDING AN ELECTRIC READOUT

William E. Engeler, Scotia, and Marvin Garfinkel, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 792,569, Jan. 21, 1969. This application Nov. 24, 1971, Ser. No. 201,855
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 CA 8 Claims

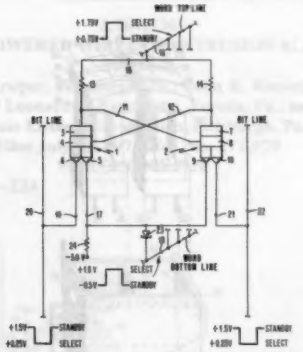


An information storing method and a storing device using a conductor-insulator-semiconductor (CIS) structure as the storage element is disclosed within. The CIS structure is initially charged to a predetermined voltage, forming a depletion region within the semiconductor beneath the conductor. Minority carriers are controllably generated within the semiconductor in proportional response to an information-bearing signal such as a specific amount of electromagnetic radiation flux. The generated minority carriers move to and are stored at the surface of the semiconductor beneath the conductor due to the electric field existing in the depletion region, thus changing the predetermined voltage. The change in voltage which may be determined in a measure of the number of generated minority carriers and, therefore, is a measure of the integrated electromagnetic radiation flux and constitutes the stored information.

3,781,828
THREE-DIMENSIONALLY ADDRESSED MEMORY

Steven Platt, Underhill, Vt., and Jehoshua N. Pomeranz, Suffern, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1972, Ser. No. 250,225
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R 19 Claims

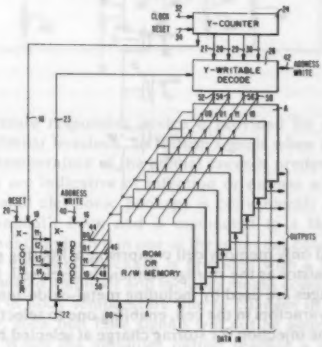


An array of memory cells is provided with each cell having a word top line, a word bottom line and a pair of bit lines connected thereto. Either a standby voltage or a select voltage is applied to each of the lines, whereby any cell of the array may be selected by applying a select voltage to the two word lines and one or both bit lines connected to the cell. In one of the disclosed embodiments, the cells are arranged in columns and in groups of rows. Each of a plurality of word top drive lines is connected to all of the rows of the cells of a respective group to select any group of rows, each of a plurality of word bottom drive lines is connected to a respective row of cells in each of the groups to select one row of the selected group, and a plurality of pairs of bit lines are provided with each pair connected to the cells of a respective column to select one column and thereby one cell of the selected row. Each cell preferably comprises a cross-coupled pair of transistors each having a collector and first and second emitters. The word top lines are connected to the collector load impedances, the word bottom lines are connected to the first emitters, and the bit lines are connected to the second emitters.

3,781,829
TEST PATTERN GENERATOR

Shanker Singh, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 16, 1972, Ser. No. 263,500
Int. Cl. G11c *13/00*
U.S. Cl. 340—173 R 9 Claims

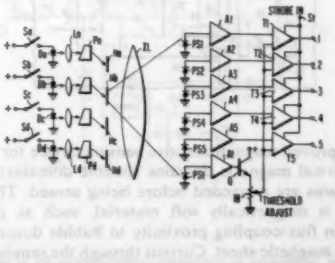


A test pattern generator comprising a memory means for storing n test pattern numbers. The memory means is responsive to a selectively alterable address means for generating a plurality of distinct test pattern sequence of numbers from the n stored test pattern numbers.

3,781,830
HOLOGRAPHIC MEMORY WITH LIGHT INTENSITY COMPENSATION MEANS

David Herman Raphael Vilkomerson, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 23, 1972, Ser. No. 265,555
Int. Cl. G11c *13/00*
U.S. Cl. 340—173 LM 1 Claim



A holographic memory is disclosed in which any one hologram in an array of holograms is illuminated by a reference

beam from a respective light-emitting diode in an array of light emitting diodes. An array of photosensors is arranged to receive the "1" and "0" binary optical information signals from whichever hologram may be illuminated. Each hologram includes a recording of an extra threshold-setting bit, and an extra threshold-setting-bit photosensor is included to establish an electrical threshold distinguishing between "1" and "0" information signals despite variations in light emission from different light-emitting diodes and holograms.

3,781,831

READ ONLY MEMORY UTILIZING FLOATING GATE TRANSISTORS AND METHOD OF PROGRAMMING

Constantine A. Neugebauer, and Joseph L. Mundy, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 30, 1972, Ser. No. 267,968

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **8 Claims**

A read only memory cell comprising a floating gate field effect transistor as the storage element is disclosed. Low operating voltages are used by including metal-oxide-semiconductor (MOS) varactors in the cell, enabling one to selectively induce avalanche injection for storing charge at selected bit sites.

3,781,832

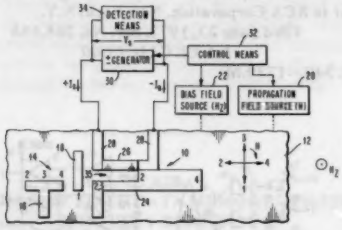
MAGNETORESISTIVE SENSING OF MAGNETIC BUBBLE DOMAINS USING EXPANSION

George S. Almasi, Katonah; Robert J. Hendel, Peekskill, and George E. Keefe, Montrose, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,914

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 EB **9 Claims**



An improved magnetoresistive sensing device for detection of cylindrical magnetic domains (bubble domains) in which the domains are expanded before being sensed. The sensing element is magnetically soft material, such as permalloy, located in flux-coupling proximity to bubble domains which exist in a magnetic sheet. Current through the sensing element aids in the bubble domain expansion and does not impede bubble domain motion even though it is of large magnitude. Due to the expansion, a greater output signal is achieved. The structure also is useful in providing bubble domain annihilation after sensing. This eliminates the usual time delay in moving the domain to an annihilator circuit for destruction and also eliminates the need for a separate annihilator circuit.

3,781,833

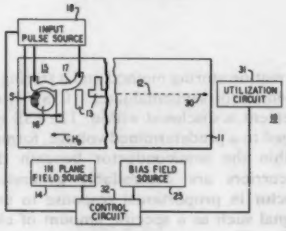
SINGLE WALL MAGNETIC DOMAIN GENERATOR

Joseph Edward Geusic, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 29, 1972, Ser. No. 284,576

Int. Cl. G11c *19/00, 11/14*

U.S. Cl. 340—174 TF **9 Claims**



Improved operating margins are exhibited by a conductor driven, single wall, magnetic domain generator because of the geometry of the conductor and its disposition with respect to the magnetically soft elements which define the generator and the propagation circuitry.

3,781,834

REDUCTION CROSS-TALK IN DOUBLE GAP HEAD

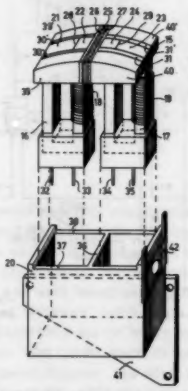
Johannes Van Ginkel, and Teunis Robert Van Heelsbergen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1972, Ser. No. 281,123

Claims priority, application Netherlands, Aug. 21, 1971, 7111554

Int. Cl. G11b *5/28*

U.S. Cl. 340—174.1 F **4 Claims**



A double gap magnetic head comprising at least one writing head and at least one reading head arranged behind the writing head in the direction of travel of the tape for writing and immediately thereafter reading information, in particular

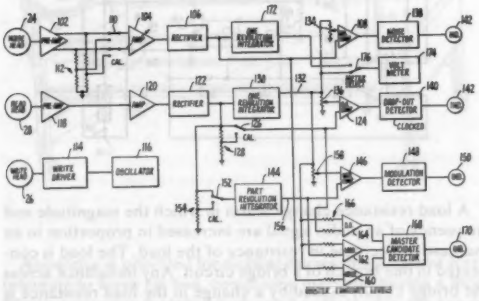
digital information, in which, to reduce the cross-talk, the writing winding is provided on one limb of the writing head and the reading winding is provided on one limb of the reading head asymmetrically relative to the central member separating the writing head and the reading head.

3,781,835

METHOD OF CERTIFYING MAGNETIC RECORDING DISC

C. Norman Dion, and Dennis T. Maruyama, both of San Jose, Calif., assignors to Memorex Corporation, South Clara, Calif.

Division of Ser. No. 229,709, Feb. 28, 1972. This application Feb. 16, 1973, Ser. No. 333,202
Int. Cl. G11b *5/44*
U.S. Cl. 340—174.1 B **2 Claims**



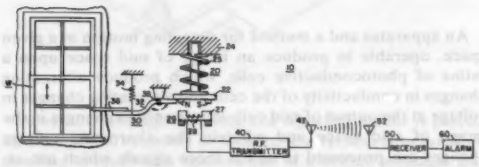
A certifier for computer disc memories in which a voice coil motor drives cam loaded read-write flying heads radially across a disc restrained by a control cam so that the heads follow a single continuous spiral path over the disc. Three read-write heads examine the disc at a test location on the spiral after D.C. erasure to read for extra bits, write data and read for missing bits. Error comparisons are made against a one revolution integration of the output of the data read head. A modulation test compares the one revolution integration of data head output to a part revolution integration of the data head output.

3,781,836

SELF-POWERED WIRELESS INTRUSION ALARM SYSTEM

Andrew P. Kruper, Pittsburgh, Pa.; John R. Reeves, Orange, Conn., and Leonard C. Vercellotti, Verona, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 14, 1972, Ser. No. 271,879
Int. Cl. G08b *5/22*
U.S. Cl. 340—224 **2 Claims**



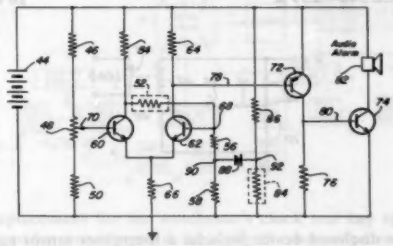
The invention pertains to an alarm system including a magnetic pulse generator for producing an output pulse in response to a change in magnetic flux in response to an intrusion of a designated area, a radio transmitter circuit responding to the pulse from the magnetic pulse generator by transmitting a signal to a remote receiver circuit which in turn generates a pulse for actuating an intrusion alarm circuit.

3,781,837

AMBIENT COMPENSATED TEMPERATURE RESPONSIVE DEVICE

Thomas W. Anderson, and Robert L. Caroon, both of Albuquerque, N. Mex., assignors to Jac, Inc., Clovis, N. Mex.

Filed July 8, 1971, Ser. No. 160,612
Int. Cl. A61b *6/10*
U.S. Cl. 340—233 **10 Claims**



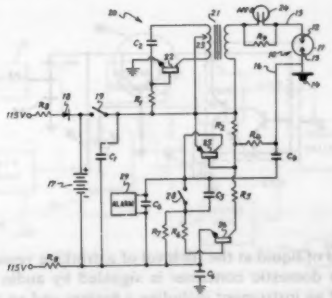
A temperature responsive device is provided for use with cattle, and similar livestock, to furnish signals when the measured body temperature of the animal exceeds predetermined limits which are indicative of infection or disease within the animal. A small electronic package is conveniently fastened about the animal's neck and is connected to a thermistor sensing element implanted in one of the outer ear canals of the animal. The electronic package is provided with a temperature compensated amplifier and includes means compensating for changes in body temperature due to changes in ambient temperature, such that false signals will not be generated by the device. When the amplifier output reaches a predetermined threshold level, a signal device, such as an audio alarm, is energized to indicate that the animal should receive immediate diagnosis or treatment.

3,781,838

PRODUCTS OF COMBUSTION DETECTOR

Charles A. Primmer, Bozeman, Mont., assignor to Development Technology, Inc., Bozeman, Mont.

Continuation-in-part of Ser. No. 80,909, Oct. 15, 1970, abandoned. This application Mar. 16, 1972, Ser. No. 235,334
Int. Cl. G08b *21/00*
U.S. Cl. 340—237 S **16 Claims**



A products of combustion detector is provided wherein a spark-gap is exposed to the ambient atmosphere and a varying

potential is applied thereto of a peak magnitude less than that required to initiate a discharge thereacross. Products of combustion in the ambient atmosphere initiate periodic arcs and a circuit is provided for giving an output signal only when a predetermined number of arcs have occurred within a given period of time.

3,781,839

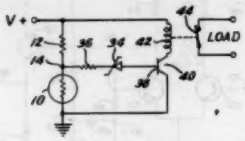
FLUID FLOW SENSING DEVICE

Clifford A. Bodge, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 811,869, April 1, 1969, abandoned. This application Jan. 7, 1972, Ser. No. 216,299

Int. Cl. G08b *21/00*

U.S. Cl. 340—239 R **10 Claims**



The disclosed device includes a thermistor sensor particularly adapted for disposition in thermal communication with a fluid medium utilized for effecting cooling of equipment. The thermistor sensor senses variations in the heat transfer characteristics of the medium, and is coupled to a power supply through a resistor, which cooperates with the thermistor sensor to define a voltage divider, including a junction. A voltage responsive means is coupled to the junction and is rendered operable in response to the establishment of an increased voltage level at the junction, when the heat transfer properties of the medium decreases. The voltage responsive means provides an electrical signal for energizing a switch means so as to render a load circuit inoperable in response to a decrease in the heat exchange properties of the fluid medium. Alternatively, the electrical signal may be utilized for operating an indicator to provide an indication of a decrease in the heat exchange properties of the fluid medium.

3,781,840

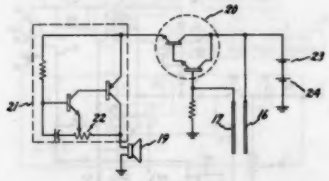
INSTRUMENT FOR GUIDING THE BLIND IN FILLING OPEN-TOP VESSELS

Richard W. Roberts, Schenectady, and George Jernakoff, Loudonville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 2, 1972, Ser. No. 259,158

Int. Cl. G08b *21/00*

U.S. Cl. 340—245 **1 Claim**



Arrival of liquid at the fill level of a drinking vessel or other open-top domestic container is signaled by audio or tactile means of an instrument including a battery and an amplifying switch in an instrument housing and a pair of electrodes which extend through the housing and serve additionally as hanger means for supporting the instrument in operating position on the vessel with the free lower ends of the electrodes exposed to contact liquid at the fill level so that the switch is actuated and a signal is generated when the filling operation is to be terminated.

3,781,841

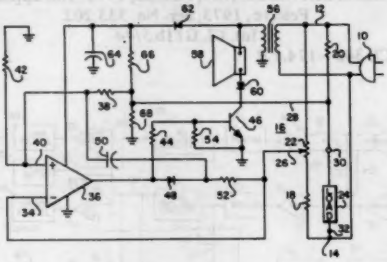
LOAD RESISTANCE CHANGE ALARM

James S. Hughes, Jr., Bellmawr, N.J., assignor to Trident Engineering Co., Bellmawr, N.J.

Filed May 4, 1972, Ser. No. 250,206

Int. Cl. G08b *21/00, 23/00*

U.S. Cl. 340—251 **10 Claims**



A load resistance change alarm in which the magnitude and frequency of an audio signal are increased in proportion to an increase or decrease in resistance of the load. The load is connected in one branch of a bridge circuit. Any imbalance across the bridge circuit caused by a change in the load resistance is applied to an amplifier having a feedback circuit. The oscillations of the amplifier circuit turn on an electronic switch which allows unilateral current flow through the speaker. The current applied to the speaker is supplied through a step down transformer from the same power supply supplying current to the load.

3,781,842

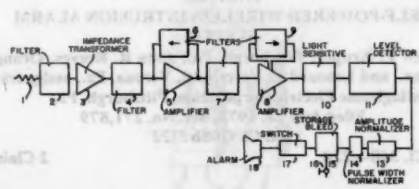
INTRUSION DETECTING APPARATUS AND METHOD

James P. Campman, Silver Spring, Md., assignor to Vidar Laboratories Inc., Kensington, Md.

Filed Apr. 27, 1972, Ser. No. 248,211

Int. Cl. G08b *13/18*

U.S. Cl. 340—258 B **8 Claims**

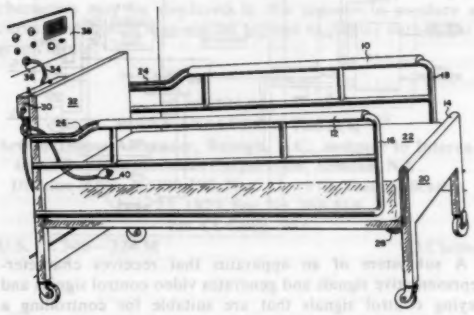


An apparatus and a method for detecting motion in a given space, operable to produce an image of said space upon a retina of photoconductive cells, which produce alternating changes in conductivity of the cells and alternating changes in voltage at the output of said cells in response to changes in the image of said space and wherein the alternating voltage changes are processed to select those signals which are attributable to the motion of an intruder in said space, to selectively amplify them, to discard those voltages of low amplitude below a predetermined level, to convert the voltage changes above the predetermined amplitude level into pulses of uniform amplitude and width, to produce a voltage dependent on the pulse rate of said pulses above a predetermined pulse rate for triggering an alarm signal for indicating intrusion.

3,781,843
BED GUARD SYSTEM

William L. Harrison, Hollis; Ronald G. Purington, Hudson, and Donald L. Anderson, Nashua, all of N.H., assignors to Sanders Associates, Nashua, N.H.

Filed Apr. 15, 1971, Ser. No. 134,247
Int. Cl. G08b 7/04; H01h 35/32, 35/34
U.S. Cl. 340—279 13 Claims

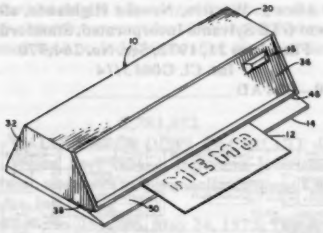


Apparatus is provided for alerting nurses that a patient is attempting to leave his bed, comprising members having a fluid filled passageway therein which can be attached to the top of the side rails and footboard of a bed. The members are coupled via lines to transducers which activate an alarm when a predetermined volume of fluid is displaced.

3,781,844
WRITTEN MESSAGE RECEIVING AND SIGNALING HOLDER

Dennis J. Lowery, 130 Santa Fe Dr., and Robert E. Merchant, 1421 N. 23rd, both of Grand Junction, Colo.

Filed Apr. 24, 1972, Ser. No. 246,713
Int. Cl. G08b 21/00
U.S. Cl. 340—281 10 Claims

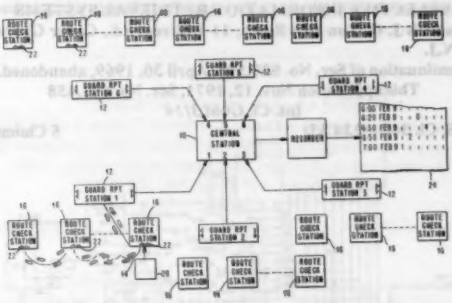


A written message receiving and signaling holder is placed on a horizontal structure or secured to a vertical structure in a dwelling to receive an inserted end of a written message, and to be responsive to such insertion creating a signal, such as a flashing red light, to be observed by a person who is to receive the message. Inside the holder an actuating and pivoting lever at one of its ends moves to accommodate the thickness of the paper and at the other end moves to close an electric circuit, inclusive of batteries and a flashing or blinking light observable through a jeweled red lens.

3,781,845
CENTRALIZED SECURITY SYSTEM EMPLOYING A MAGNETIC CHECKING DEVICE

Joseph M. Ellul, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1972, Ser. No. 267,292
Int. Cl. G08b 25/00
U.S. Cl. 340—306 8 Claims

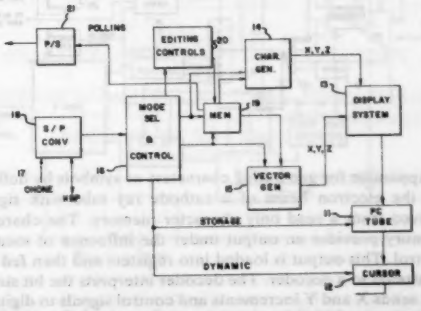


A replacement for the watchman's clock and key system employed by security guards to verify that security tours are properly made. In this new system, the guard carries a card with magnetizable rods in it instead of the watchman's clock. He then proceeds to a number of checking stations along the route of his security tour where, instead of the key which is inserted into the watchman's clock, there are a number of boxes into which the magnetizable card is inserted. These boxes contain magnets which may or may not effect the magnetization of the bars in the card. When the tour is completed the guard inserts the card into a reporting station where the magnetic card is checked. If the security tour has been made properly the right rods will be magnetized in a particular manner by the magnets in the boxes and the checking station will send a signal to a central recording station to indicate completion of a properly executed tour. If the tour was not properly made and the proper bars magnetized, no such signal is sent to the recording station and the guard is told so. The guard must then report into the central location or repeat the round.

3,781,846
PROJECTION STORAGE-DISPLAY SYSTEM HAVING DYNAMIC GRAPHIC CAPABILITY

William E. Eichelberger, and Lawrence H. Wood, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed July 15, 1971, Ser. No. 162,971
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 5 Claims



A visual display system includes a projection type display device. This includes a stored image photochromic type

device and a dynamic cathode ray device. The stored image tube is normally used for the display of alpha numerics and vectors in response to digital inputs. The dynamic cathode ray device is normally used to produce a cursor on the display. Dynamic refresh memory for the dynamic cathode ray tube gives this device the capability of selectively erasing, editing and inserting graphic information on the display.

3,781,847

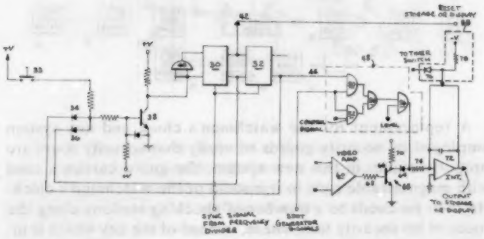
SELECTIVE INFORMATION RETRIEVAL SYSTEMS

Francois J. G. Van Den Bosch, 11 Hillcrest Rd., Cedar Grove, N.J.

Continuation of Ser. No. 820,595, April 30, 1969, abandoned. This application Nov. 12, 1971, Ser. No. 198,458

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD **5 Claims**



A delay network for providing a signal to the sweep generating circuits of a video tube to present thereon a line for every 2½ lines of the line frequency is driven from selected signals within a frequency divider network which also provides a desired frame frequency output signal. A delay gating circuit is provided to control the storage or display of selected information on the video tube.

3,781,848

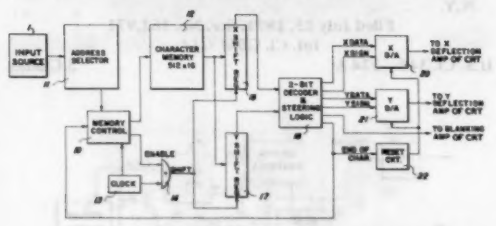
DISPLAY SYSTEM

Jerome A. Rosenthal, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1971, Ser. No. 212,934

Int. Cl. G06f 3/14

U.S. Cl. 340—324 A **4 Claims**



Apparatus for generating characters or symbols by deflecting the electron beam of a cathode ray tube with signals derived from a read only character memory. The character memory provides an output under the influence of memory control. This output is loaded into registers and then fed as a bit stream to a decoder. The decoder interprets the bit stream and sends X and Y increments and control signals to digital to analog converters which generate strokes to form the desired characters on the screen of the cathode ray tube.

3,781,849

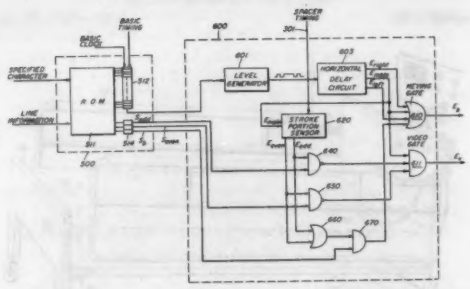
METHOD AND APPARATUS FOR GENERATING SELF CONTRASTING CHARACTER IMAGES

Stanley N. Baron, Stamford, Conn., and Stephen Kreinik, Monsey, N.Y., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Mar. 20, 1972, Ser. No. 236,428

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD **19 Claims**



A subsystem of an apparatus that receives character-representative signals and generates video control signals and keying control signals that are suitable for controlling a scanned display to present contrasting character images. A stroke generator means, responsive to the character-representative signals, generates a stroke of a character to be displayed. The stroke consists of a plurality of time sequential bits corresponding to a sequence of display events and a plurality of code bits that distinguish between contrasting portions of the sequence of display events. A decoding means is responsive to the time sequential bits and the code bits and generates keying control signals and video control signals that are suitable for controlling a scanned display to present contrasted images of characters to be displayed. In a preferred embodiment of the invention, the code bits are representative of the keying and video portions of the sequence of display events. The coding means produces signals that disable the generation of video signal during selected stroke portions, the code bits being determinative of which portions of the display event are to be disabled.

3,781,850

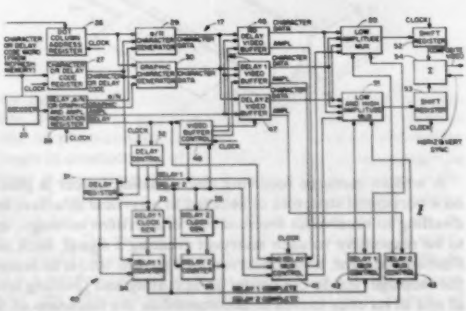
TELEVISION TYPE DISPLAY SYSTEM FOR DISPLAYING INFORMATION IN THE FORM OF CURVES OR GRAPHS

Francis A. Gicca, Bedford; Francis C. Passavant, West Newton, and Allen J. Worters, Newton Highlands, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 21, 1972, Ser. No. 264,970

Int. Cl. G06f 3/14

U.S. Cl. 340—324 AD **8 Claims**



Television type display system for displaying information in the form of curves or graphs. Code words designating charac-

ters are read out of a random access memory and the characters are displayed at fixed normal locations on the display surface of the display device. The normal location of a character on the display surface is determined bp the position of the character code word in the memory. Delay code words designating amounts of delay may be associated with characters by being stored in the position in the memory preceding a character code word. The delay code word is employed to hold the character data for each scanline in a buffer for a period of time determined by the delay code word before releasing the data into the video stream. Thus, display of the character is delayed causing it to appear in a location on the display surface shifted from its normal location. A plurality of characters may be displayed in this manner to produce a curve. The system may also be utilized to display data in bargraph format.

3,781,851

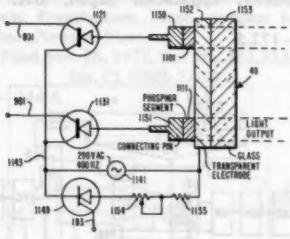
PULSE ANALYZING TESTER

Arthur Duane Alexander, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 88,298, Nov. 11, 1970. This application June 22, 1972, Ser. No. 266,515

Int. Cl. G06g 7/04

U.S. Cl. 340—324 M **3 Claims**



A digital display device includes an upper and lower row of electroluminescent display elements each controlled by a silicon controlled rectifier gated by the output of a stage of a data buffer for applying an alternating potential to each display element; a blanking control circuit for controlling the amplitude of the alternating potential applied to the display elements; an image control switch for selectively operating the display device to be unblanked, to be blanked or to be automatically blanked except when input lines are energized; and a display time extension circuit for allowing a display device to be operational for a period of time after the input lines are deenergized.

3,781,852

CALCULATOR DISPLAY CIRCUIT

Edward A. White, Fort Wayne, Ind., and James H. Bunting, Acton, Mass., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

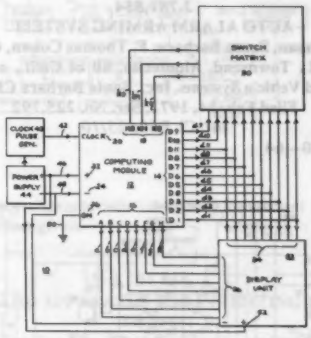
Division of Ser. No. 256,286, May 24, 1972. This application Nov. 21, 1972, Ser. No. 308,473

Int. Cl. G06f 3/14

U.S. Cl. 340—324 R **11 Claims**

A display circuit for use in electronic calculator which includes a computing circuit for receiving and manipulating digital datum, the computing circuit including first means for repetitively generating a plurality of input signals individually in sequence and second means for repetitively generating a plurality of sequentially occurring groups of output signals with individual ones of the input and output signals occurring simultaneously, a plurality of input terminals, keyboard means for coupling the input terminals to receive selected ones of the input signals, means for generating a repeating clock pulse signal, and a power supply.

The display circuit comprises a plurality of luminescing display devices each of which includes a common element and a plurality of segment elements individually coupled to the common element and disposed in a geometric array corresponding to selected alpha-numeric characters. A plurality of digit driver amplifiers are coupled to the computing circuit to receive predetermined ones of the input signals and electrically in series with the predetermined ones of the common elements, and a plurality of segment driver amplifiers are coupled



to the computing circuit to receive predetermined ones of the signals of said groups of output signals and connected electrically in series with all of the paralleled similar segment elements of all of said display devices. The digit driver amplifiers and segment driver amplifiers are rendered simultaneously and momentarily operative in response to the simultaneous reception of the input signals and groups of output signals with essentially all of the electrical energy passing through the segment and digit driver amplifiers, respectively, also passing through the display devices. The display devices are rendered individually, momentarily, and sequentially luminescent thereby.

3,781,853

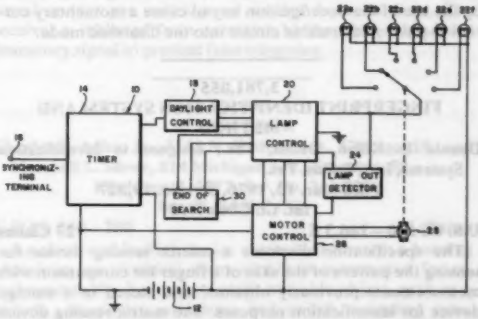
NAVIGATIONAL LIGHT SYSTEM

Thomas A. Jacobs, Houston, Tex., assignor to Tideland Signal Corporation, Houston, Tex.

Filed Dec. 23, 1971, Ser. No. 211,605

Int. Cl. G08g 3/00

U.S. Cl. 340—29 **6 Claims**



A flashing light timer for a navigational light having provision to send, receive and utilize a synchronizing signal in

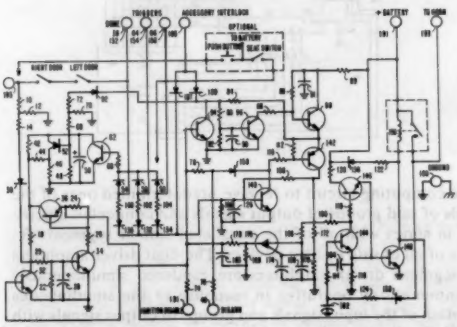
which a plurality of lights have their timers connected together so as to flash simultaneously, but will still operate in the event any one of the navigational lights fail. A coded timer for controlling the flashing code of a navigational light having a plurality of time constant circuits connected to a counter for readily changing the flashing code of a light. A navigational light having a logical circuit for sensing a burned out lamp without requiring a resistive element. A lamp changing circuit that allows the new lamp to be placed accurately into operative position. And a circuit for switching off power from the navigational light during the lamp changing process for preventing sparking of the electrical contacts.

3,781,854

AUTO ALARM ARMING SYSTEM

Peter Kaufman, Santa Barbara; F. Thomas Colsen, Goleta, and Robert L. Townsend, Montecito, all of Calif., assignors to Educated Vehicle Systems, Inc., Santa Barbara City, Calif.

Filed Feb. 14, 1972, Ser. No. 225,792
Int. Cl. B60r *25/10*
U.S. Cl. 340—64 **9 Claims**



An alarm system comprises an armable circuit, an arming circuit adapted to pulse said armable circuit into its armed or "on" position and including a timer to activate said arming circuit after the passage of a fixed time period, a timer initiator for starting the timer into its timing mode, reset means to return and hold said timer in its initial or zero position only within said fixed time period to allow for a fixed or limited time for the reopening of doors and/or trunk without setting off the alarm, said armable circuit when in the armed mode being triggered by at least one automotive courtesy or dome light switch, hood switch, trunk switch and/or pressure sensitive seat belt interlock switch to complete the circuit allowing current to flow through said circuit to the automotive lights, horn, or other audible alarm device, a disarming circuit closed by the use of the door/ignition key to cause a momentary current to pulse said armable circuit into the disarmed mode.

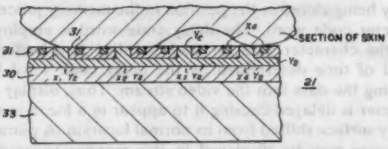
3,781,855

FINGERPRINT IDENTIFICATION SYSTEM AND METHOD

Donald E. Killen, Dallas, Tex., assignor to Identification Systems, Inc., Dallas, Tex.

Filed Mar. 13, 1970, Ser. No. 19,327
Int. Cl. G06k *9/12*
U.S. Cl. 340—146.3 E **27 Claims**

The specification discloses a matrix sensing device for sensing the pattern of the skin of a finger for comparison with measurements previously obtained and stored in a storage device for identification purposes. The matrix sensing device comprises a plurality of electrical conductance sensing means located in rows and columns in a planar surface for contacting the skin of a finger. Selection mean is provided for sequentially selecting each sensing means row by row for sequentially measuring the electrical conductance of the skin at a plurality of points in an orderly fashion. Initially, in a first cycle, the conductance is sequentially measured and an average value



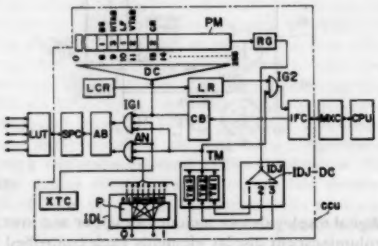
obtained. Subsequently, in a second cycle, each measurement obtained is compared to the average value. From the resulting measurements there is derived a signal image of the pattern of the skin of the finger for use for identification purposes.

3,781,856

TERMINAL COMMUNICATION CONTROL SYSTEM AND METHOD

Tetsuya Aizawa, Kawasaki; Taketoyo Sawada, Sagamihara; Yoshihiko Tauchi, Yokohama; Tsutomu Kawamata, Tokyo, and Hiroshi Saya, Yokohama, all of Japan, assignors to Nippon Telephone & Telephone Public Corporation, Tokyo and Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1971, Ser. No. 210,640
Claims priority, application Japan, Dec. 26, 1970, 45/118994
U.S. Cl. 340—172.5 **14 Claims**



In a data processing system, a communication control system for terminal equipment, such as a typewriter, receives and processes control codes for that terminal equipment for controlling the operation thereof and, particularly, automatically inserts idle codes immediately after certain control codes such as for controlling line feed, tabulation, and carriage return operations. Control codes received by the control system from a central processing unit are collated with character classification information stored in a memory of the control system for detecting and identifying the predetermined control codes. For each such identified control code, a signal-inserting circuit is actuated for inserting an idle code of prescribed length immediately thereafter and thus prior to the next successive control code, to afford sufficient time for proper operation of the terminal equipment. Through use of the invention, programming requirements of the central processing unit are greatly simplified and the length of data required to be transmitted is minimized.

3,781,857

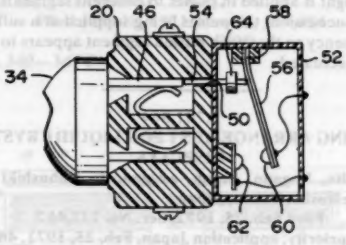
CONDITION RESPONSIVE RECEPTACLES

Joseph L. Stendig, 2500 Riverside Dr., and Claude A. Davis, 568 Riney Forest Rd., both of Danville, Va.

Filed Feb. 18, 1972, Ser. No. 227,402
Int. Cl. G08b *19/00*
U.S. Cl. 340—420 **9 Claims**

Power receptacles having an exterior appearance of that of a conventional receptacle and including a switching device

responsive both to insertion and/or removal of a plug and to an external condition such as heat or electrical current. An alarm device may be mounted on the receptacle for cooperation with the switching device to signal the occurrence of predetermined conditions sensed by the switching device.

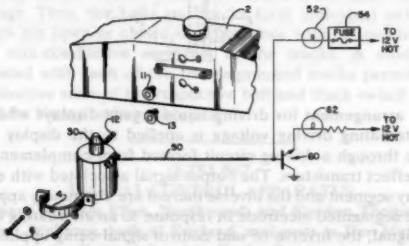


3,781,858

FLUID LEVEL MONITORING SYSTEM

John R. Lewis, Framingham, Mass., assignor to Harnessed Energies, Inc., Newton, Mass.

Filed Nov. 26, 1971, Ser. No. 202,353
Int. Cl. G08b *21/00*
U.S. Cl. 340—244 A 9 Claims



A fluid level indicator wherein a float in a float chamber is responsive to the level of fluid in a vessel with which it communicates. The float carries a magnet which actuates a reed switch when the level of fluid in the float chamber reaches a predetermined level. A monitor connected to the reed switch indicates when the switch is actuated. A plunger disposed in the indicator when depressed moves the float, i.e., magnet, to actuate the reed switch regardless of the level of fluid in the float chamber whereby the monitoring system may be validated.

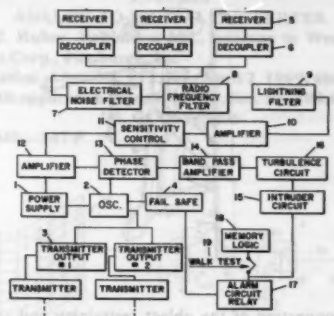
3,781,859

CONTROLLED WAVE PATTERN ULTRASONIC BURGLAR ALARM

Albert L. Hermans, c/o Seabroad Electric, 2255 Bancroft Ave., San Leandro, Calif.

Filed Apr. 19, 1972, Ser. No. 245,535
Int. Cl. G08b *13/16*
U.S. Cl. 340—258 A 8 Claims

A burglar alarm employs ultrasonic sound to protect a plurality of rooms. Each protected room contains a transmitter which emits an ultrasonic signal in a controlled wave pattern. The signal is received, filtered, and detected to determine if a doppler shift in the ultrasonic signal of a particular amplitude and frequency characteristic of human movement is present. If so, an alarm is given.

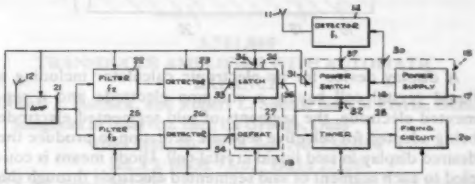


3,781,860

METHOD AND APPARATUS FOR INHIBITING ARTICLE THEFT

Edward N. Freyling, Jr., Scottsdale, Ariz., assignor to Walter A. Williamson, Scottsdale, Ariz.

Filed Feb. 14, 1972, Ser. No. 226,098
Int. Cl. G08b *13/24*; H04b *7/00*
U.S. Cl. 340—280 19 Claims



A system for detecting article theft wherein different frequency signals are transmitted at the access paths and a receiver associated with the article is responsive to the transmitted signals to actuate a timing device. At the end of an interval, a tear gas cartridge or similar device is fired. The receiver is inhibited from operation by the receipt of a third frequency signal to prevent false triggering.

3,781,861

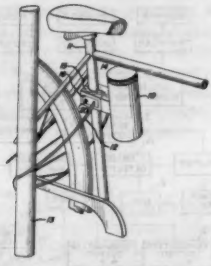
ALARM LOCK

Charles F. Adler, Jr., 3153 N. Hudson Ave., Chicago, Ill., and Marshall L. Silver, 814 Michigan Ave., Evanston, Ill.

Filed Apr. 4, 1972, Ser. No. 241,005
Int. Cl. G08b *21/00*
U.S. Cl. 340—280 6 Claims

An alarm and locking device is provided wherein a housing containing an electrical alarm circuit is constructed for attachment to the body of an easily movable object, such as a bicycle. An object restraining and switch activating component is provided to enable the movable object to be connected to a fixed object when the component is locked into position with the housing. Any cutting or interruption of the connection made by the object restraining and switch activating component operates a switch in the electrical alarm circuit

thereby allowing current to pass to and activate a warning signal. Once the warning signal is activated rejoining the



severed connection of the object restraining and switch activating component will not deactivate it.

3,781,862

DISPLAY DEVICE FOR ELECTRONIC CALCULATOR

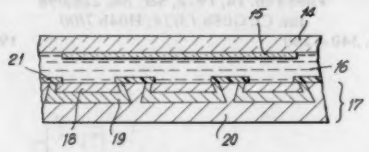
Katsumi Yamamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 27, 1971, Ser. No. 166,383

Claims priority, application Japan, July 27, 1970, 45/65034

Int. Cl. G09f 9/30

U.S. Cl. 340—336 **8 Claims**



A display device for an electronic calculator including a liquid crystal cell having a common electrode and a segmented electrode, the segments of said segmented electrode being adapted for selective separate actuation to produce the desired display in said liquid crystal cell. Diode means is coupled to each segment of said segmented electrode through the cathode thereof. Condenser means may also be coupled intermediate each of said segments of said segmented electrode and said common electrode.

3,781,863

DIGITAL DISPLAY DEVICE

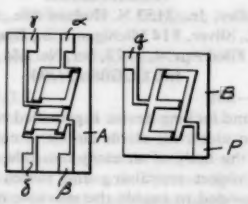
Kinji Fujita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan

Filed Dec. 20, 1971, Ser. No. 209,986

Claims priority, application Japan, Dec. 23, 1970, 45/116254

Int. Cl. G08b 5/36

U.S. Cl. 340—336 **6 Claims**



In an improved digital display device relying on the phenomenon of dispersion of incident light by nematic crystals across which an electric field is imposed, an arrangement of transparent conductive segments in groups on opposing parallel plates makes it possible to reduce the number of leads necessary for displaying any digit from zero to nine from the conventional eight leads to six leads. The impressed voltage necessary for causing the nematic liquid crystals to disperse light is applied in pulses to different segments in each group in succession, the pulses being supplied at a sufficiently high frequency so that each pulsed segment appears to be continuously actuated.

3,781,864

DRIVING ARRANGEMENT FOR LIQUID CRYSTAL DISPLAYS

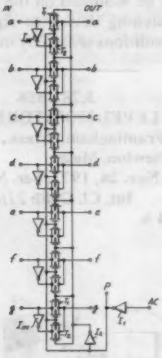
Kinji Fujita, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 25, 1972, Ser. No. 232,462

Claims priority, application Japan, Feb. 25, 1971, 46/8976

Int. Cl. G08b 5/36

U.S. Cl. 340—336 **12 Claims**



An arrangement for driving liquid crystal displays wherein an alternating driving voltage is applied to the display segments through a driving circuit formed from complementary field effect transistors. The output signal associated with each display segment and the inverse thereof are alternately applied to the segmented electrode in response to an alternating control signal, the inverse of said control signal being applied to the common electrode of the display.

3,781,865

DISPLAY DEVICE FOR ELECTRONIC DESK CALCULATOR

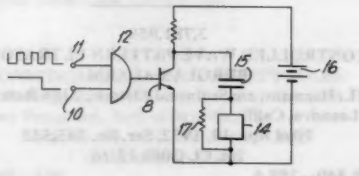
Yoshio Yamazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 44,839, June 9, 1970, abandoned. This application Mar. 20, 1972, Ser. No. 236,294

Claims priority, application Japan, June 21, 1969, 44/48679

Int. Cl. G08b 5/36

U.S. Cl. 340—336 **8 Claims**



A display device for an electronic desk calcuator incorporating liquid crystals of the nematic phase which cause light

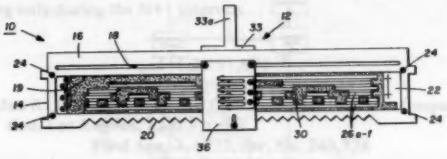
scattering when AC or DC voltages are applied thereto. Driving circuits are provided for applying an AC driving voltage to a display incorporating said liquid crystals.

3,781,866

BINARY ENCODING SWITCH

Jack S. Kilby, 7723 Midbury, Dallas, Tex.

Filed June 18, 1971, Ser. No. 154,494
Int. Cl. G08c 9/08
U.S. Cl. 340—347 P 8 Claims



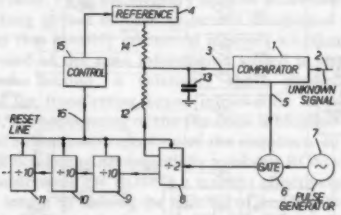
A binary encoding switch is described having a slide which is manually movable along a linear path adjacent a printed circuit board. The printed circuit board has five tracks comprised of conductive and non-conductive segments and a sixth track that is continuously conductive. The slide houses six conductive balls, each of which is biased into engagement with one of the tracks by a separate conductive leaf spring. A guide way is associated with the printed circuit board for guiding the slide along the linear path. A set of detents is also associated with the printed circuit board and a detent pin is carried by the slide. The detent pin is manually disengaged by the same operating tab used to move the slide longitudinally of the track. Electrical energy is continuously provided to the balls by way of the continuously conductive track and the leaf springs. Thus, the balls and tracks form individual switches which are open or closed in accordance with the conductive and non-conductive segments of the tracks. A diode associated with each of the five segmented tracks permits the conductive state of the respective ball and track switch to be used for binary coding purposes.

3,781,867

DIGITAL CONTROL APPARATUS

Leonard William Ellen, Northwood, and Gordon Thomas Davies, Wallasey, both of England, assignors to Her Majesty's Postmaster General, London, England

Continuation of Ser. No. 785,689, Dec. 20, 1968, abandoned.
This application July 19, 1971, Ser. No. 164,000
Claims priority, application Great Britain, Jan. 8, 1968, 44771/68
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 5 Claims



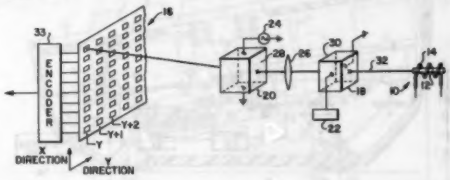
Digital display apparatus having a source of electric pulses feeding a counter has an extra binary counting stage interposed between the source and the counter. The setting of the extra stage at the end of a counting period is used to vary very slightly the number of pulses received by the counter during a succeeding counting period.

3,781,868

ANALOG-TO-DIGITAL CONVERTER

Charles J. Huber, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 812,645, April 2, 1969, abandoned.
This application Sept. 29, 1971, Ser. No. 184,674
Int. Cl. G08c 9/06
U.S. Cl. 340—347 P 5 Claims



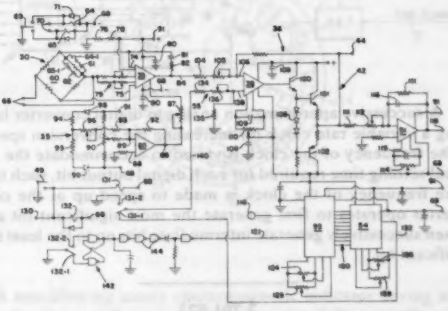
Apparatus is disclosed for the conversion of an analog signal to its sampled digital form. The conversion is accomplished by deflecting a collimated beam of light with an electro-optic device driven by the analog signal. A plurality of light activated elements or phototransistors are positioned in the path of beam after it passes through the electro-optic device. The light activated elements are arranged in a predetermined pattern such that as the level of the analog signal varies and thus the deflection of the beam varies, different ones of the elements are correspondingly activated. Means including electrical circuit apparatus is connected to the elements for providing a digital output representative of the analog signal.

3,781,869

TRANSDUCER AMPLIFIER WITH AUTOMATIC BALANCE

Dennis J. Sudnick, and Robert L. Shutts, both of Elyria, Ohio, assignors to Inservco, Inc., La Grange, Ohio

Filed Mar. 20, 1972, Ser. No. 236,056
Int. Cl. H03k 13/02; G01n 21/20
U.S. Cl. 340—347 CC 17 Claims



An amplifier for strain gages and other transducers in quarter, half or full bridge configurations provides an analog output suited for measurement, control or display purposes. The amplifier includes temperature compensation and automatic zero balance, the former realized from the voltage-temperature characteristic of a silicon PN junction used to affect the offset of an integrated circuit amplifier stage. The signal

for zero balance is derived from the amplifier output, sampled and retained in an analog to digital converter and reconverted to analog form for application to a stage of the amplifier in opposition to the measurement signal, resetting for zero balance being under manual control.

3,781,870

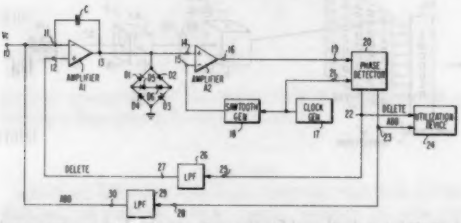
VOLTAGE TO PULSE WIDTH CONVERTER

George Athan Cutsogeorge, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 20, 1972, Ser. No. 245,861

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **8 Claims**



A circuit for converting an input voltage, the polarity and magnitude of which may vary, into two sets of pulses, one for each polarity of input voltage. The width of each pulse is related to the magnitude of the input voltage. The circuit includes a feedback arrangement to enhance the accuracy of the circuit.

3,781,871

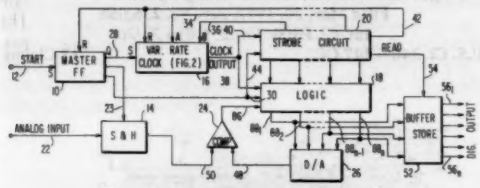
ANALOG TO DIGITAL CONVERTER

John Mattern, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1972, Ser. No. 262,436

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **10 Claims**



A successive approximation analog to digital converter having a variable rate clock for increasing the conversion speed. The frequency of the clock is varied to accommodate the actual settling time required for each digital output bit, such that the frequency of the clock is made to speed up as the converter operates to first generate the most significant bit and then successively generate intermediate bits up to the least significant bit.

3,781,872

ANALOG-TO-DIGITAL CONVERSION FOR PROCESSING WIDE-RANGE AND NON-LINEAR INPUT SIGNALS

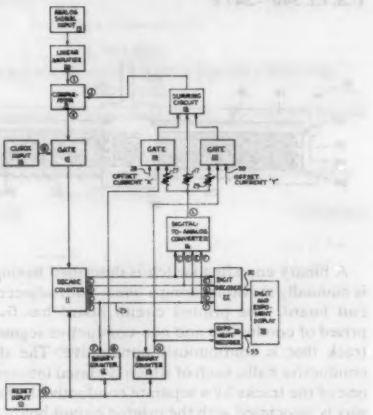
George J. Frye, and Arnold M. Frisch, both of Portland, Oreg., assignors to Elektros, Inc., Tigard, Oreg.

Filed Sept. 11, 1972, Ser. No. 287,627

Int. Cl. H03r *13/00*

U.S. Cl. 340—347 AD **18 Claims**

An analog-to-digital converter for processing non-linear input signals which may vary over several orders of magnitude. In order to speed up signal processing time, the digital output signals of the converter are limited to a representation of a single significant digit and an exponent, indicative of the order of magnitude of the digit. The converter is of the range-stepping sequential comparison type in which the input analog signal is compared with a staircase waveform signal of predetermined incremental amplitude stepped by a decade counter. A series of binary counters triggered sequentially at



the completion of each decade by the decade counter control associated gates which, through the use of respective summing resistors and DC offset signal levels, adjust the amplitude of steps within the respective decades so that the digitized output of the converter may be fitted to a straightline approximation of a non-linear function in a manner which compensates for both the non-linearity and order of magnitude of the input signal to be converted.

3,781,873

DIGITAL DATA TRANSMISSION SYSTEM USING MULTILEVEL ENCODING WITH VARIABLE DIPULSE SPACING

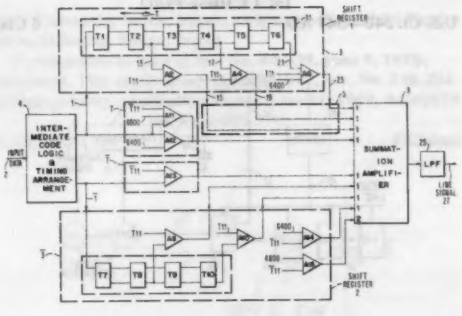
Henri Jean Nussbaumer, La Gaude, France, assignor to International Business Machine Corporation, Armonk, N.Y.

Filed Dec. 4, 1970, Ser. No. 95,223

Claims priority, application France, Dec. 30, 1969, 6945782

Int. Cl. H04l *3/00*

U.S. Cl. 340—347 DD **4 Claims**



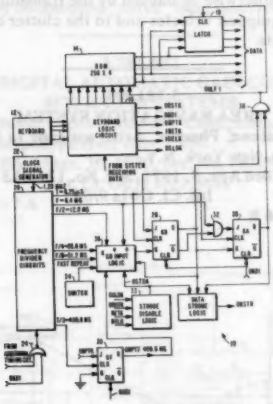
A digital data communication system in which N successive data elements generated within T seconds are encoded for transmission such that each data element is represented by a

pulse and at some predetermined time later by the inverse of that pulse. The magnitude of the pulse and its later occurring inverse is governed according to the encoding rule of the particular multilevel (partial response) code actually used. In order to reduce the interference between inverse pulses and the original pulses of subsequently encoded data elements, the first pulse of each of the N successive data elements is encoded during corresponding successive ones of the N out of the next N+1 occuring intervals of duration T/N seconds, the N+1 interval being unused. The second and inverse pulse of each pair, starting with the first pair, is transmitted respectively N(T/N), (N−1) (T/N), (N−2) (T/N), —T/N seconds after the first pulse. This results in all of the inverse pulses interfering only during the N+1 intervals.

3,781,874
KEYBOARD ENTRY SYSTEM

Alan K. Jennings, Anaheim, Calif., assignor to Pertec Corporation, Los Angeles, Calif.

Filed Apr. 3, 1972, Ser. No. 240,728
Int. Cl. G06f *3/02*
U.S. Cl. 340—365 S **12 Claims**

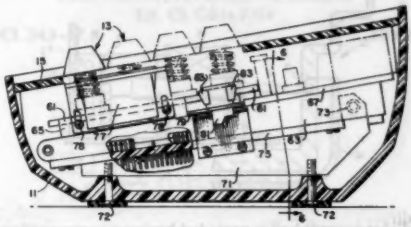


A keyboard entry system includes a keyboard, a read only memory (ROM) addressed by activation of a key on the keyboard and a digital timing circuit. The timing circuit includes a pair of flip flops which are sequenced through successive mutually exclusive states to control the output of encoded signals to an information receiving device in response to key activation. These sequenced states provide timing for three basic functions. First, the memory must be addressed for a sufficiently long period of time to permit dissipation of switch bounce so that possibly erroneous memory locations will not be addressed at the time information stored in the ROM is transferred. Second, a relatively short strobe pulse is generated for transferring keyed information to the system; and third, the sequencing of the flip flops is blocked to permit control of subsequent repeating of the sequence. In addition, advantage is taken of commercially available ROM configurations by addressing the ROM in a manner effectively doubling the word length by halving the number of words. The blocking function is terminated when there is a new key activation or, in the event an automatic repeat key is depressed, at the conclusion of first and subsequent periods of continuous key depression. The first period is relatively long to prevent unwanted automatic repeat and the subsequent periods may be chosen to provide automatic repeat at either 10 or 20 cycles per second.

3,781,875
MECHANICAL ARRANGEMENT OF THE TELEVISION GENERATOR

William L. King, Wheaton, Md., assignor to Datavision, Inc., Rockville, Md.

Filed Oct. 4, 1971, Ser. No. 186,262
Int. Cl. G08b *5/36*
U.S. Cl. 340—365 R **10 Claims**

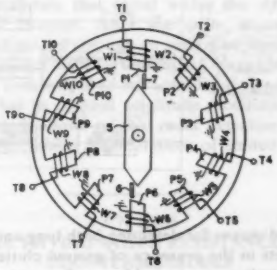


A television character generator is provided with a housing and keyboard arrangement in which the video signal generating circuitry is located directly beneath the keyboard. The keyboard, which is a mercury switch operated encoding keyboard, and video signal generating circuitry are mounted on a folding frame which can be unfolded to provide ready access to the keyboard and circuitry.

3,781,876
ROTARY ELECTROMAGNETIC INDICATOR

Richard C. McComb, Newington, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 814,620, April 9, 1969, abandoned. This application Oct. 12, 1971, Ser. No. 188,294
Int. Cl. G09f *11/10*
U.S. Cl. 340—378 MW **1 Claim**



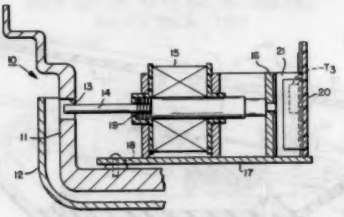
A non-blinking rotary electromagnetic indicator having an annular stator with equiangularly spaced radially inwardly extending salient poles with windings disposed thereon and a rotor with a permanent magnet rotatable into alignment with the salient poles in accordance with the operation of the stator windings and a symbol bearing drum encircling the stator. A rotor vane of ferromagnetic material is provided next to each pole of the rotor magnet angularly offset from the magnetic axis of the permanent magnet and extending outwardly of the permanent magnet pole to provide a turning force on the rotor when it is to be rotated to a 180° opposite position.

3,781,877

ASTABLE MULTIVIBRATOR D.C. BELL

Charles Berns, Brookfield, Conn., assignor to Edwards Company, Inc., Norwalk, Conn.

Continuation of Ser. No. 53,752, July 10, 1970, abandoned.
This application Apr. 14, 1972, Ser. No. 244,312
Int. Cl. G10k 1/065
U.S. Cl. 340—396 3 Claims



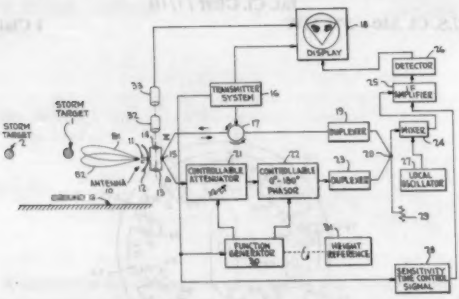
A direct current bell is provided having a reciprocating bell striker driven by an astable multivibrator having first and second timing capacitors of different values for providing a 40 percent duty cycle at the natural frequency of the bell striker. A means is provided for protecting the transistors of the multivibrator from excessive reverse bias potentials generated by the timing capacitors.

3,781,878

MEANS FOR SUPPRESSING GROUND CLUTTER IN AIRBORNE RADAR

George M. Kirkpatrick, 202 David Dr., Syracuse, N.Y.

Filed July 29, 1971, Ser. No. 167,134
Int. Cl. G01s 9/02
U.S. Cl. 343—5 W 4 Claims



Method and means for detecting both long and short range weather targets in the presence of grour 1 clutter in which a receive antenna beam is steered from a first generally elevated beam position to a second generally horizontal beam position in accordance with a beam steering program.

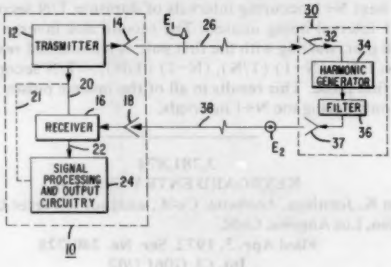
3,781,879

HARMONIC RADAR DETECTING AND RANGING SYSTEM FOR AUTOMOTIVE VEHICLES

Harold Staras, and Joshua Shefer, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 30, 1972, Ser. No. 267,947
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 11 Claims

In a vehicular harmonic radar detecting and ranging system, a transmitter transmits a highly directional and polarized beam of electromagnetic energy, preferably in the microwave spectrum, toward a passive target. The passive target reradiates a beam of energy, which is harmonically related to and polarized orthogonal to the transmitted beam, directionally back toward the transmitter. A receiver by being selectively responsive the the harmonically related and orthogonally polarized reradiated beam, is immune to blinding which would otherwise be caused by the transmitted signals of other radar equipped vehicles and to the clutter caused by extraneous targets.

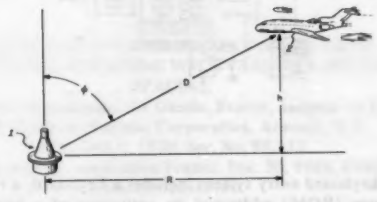


3,781,880

AREA NAVIGATION SYSTEM

Robert S. Jacobson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 5, 1971, Ser. No. 131,013
Int. Cl. G01s 9/02
U.S. Cl. 343—6 R 2 Claims



An apparatus permitting area navigation employs radio distance measuring equipment transmissions and omni-range radio transmissions from a guidance transmitter system for craft-borne employment of magnetic azimuth and actual ground range of the craft with respect to the guidance transmitter location.

3,781,881

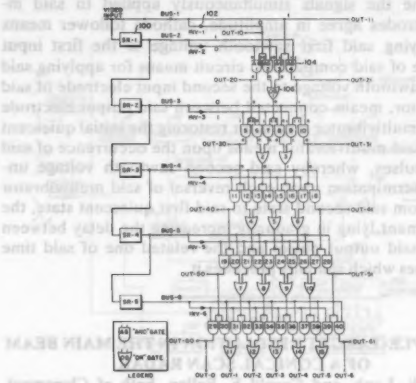
BEACON TARGET SELECTOR AND EVALUATOR

John M. Hovey, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 21, 1972, Ser. No. 273,912
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R 5 Claims

An IFF target evaluator comprising signal-storage means consisting of a plurality of series-connected shift registers each of whose outputs are also connected to a different level of a Pascal-triangle configuration of AND and OR gates used as a decoding means. The outputs of the decoding means show

whether a series of consecutive pulse positions contain enough pulses to indicate a target; how many consecutive "ones" have



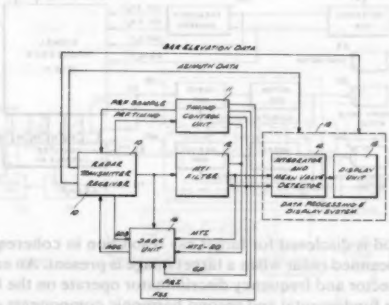
been received from a predetermined number of range sweeps; and how many consecutive "zeros" have been received.

3,781,882

ADAPTIVE DIGITAL AUTOMATIC GAIN CONTROL FOR MTI RADAR SYSTEMS

Dieter E. Holberg, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 30, 1970, Ser. No. 76,850
Int. Cl. G01s 9/02, 9/42
U.S. Cl. 343—7 A **8 Claims**



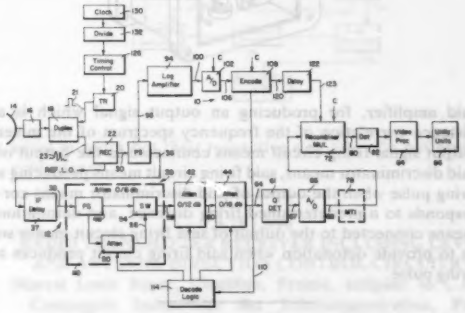
An adaptive digital automatic gain control (DAGC) system is disclosed for pulsed radar moving target indicator (MTI) systems to reduce the input dynamic range requirements of a data processing and display system by dividing each range sweep into a number of range elements of one or more range bins, comparing the signal level in each range element to a selected reference level, and providing a digital error signal indicating whether or not the video signal is greater than the reference signal. The radar video signal is processed by an MTI filter, the output of which is compared with a selected reference level to similarly provide digital error signals for AGC control based on not only the raw radar video signal, but also the MTI video signal. These digital error signals are integrated separately for each range element, thereby developing for each range element an AGC signal in digital form based on the past history in the raw radar video signal and the MTI video signal over a continuous succession of range sweeps. After conversion into analog form, these digital AGC signals developed for all range bins of a given sweep are filtered by a low pass filter to provide an analog AGC signal which is smooth over approximately 16 range bins. A noise AGC signal is similarly developed and combined with the radar video and MTI video AGC, but at a much slower rate of one sample per azimuth scan.

3,781,883

DYNAMIC RANGE CONTROL SYSTEM HAVING AMPLITUDE RESTORATION

David D. Effinger, La Habra; Norol T. Evans, San Pedro, and Vaughn H. Estrick, Fullerton, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 10, 1972, Ser. No. 233,833
Int. Cl. G01s 9/04
U.S. Cl. 343—7 A **10 Claims**



An automatic dynamic range control system that eliminates the effect of dynamic range limitations in the main radar channel and restores the signal amplitude prior to detection. A separate auxiliary measurement channel is provided in parallel with the main IF channel having a logarithmic amplifier or sequential detector with sufficient dynamic range to meet the signal informational requirements. During each range bin period, the IF signal in the auxiliary channel is quantized in amplitude above the predetermined dynamic range of the main channel within selected ranges of input signal level to form coded signals. The quantized levels are then utilized substantially in real time for attenuating the signal in the main IF channel to maintain that signal within the dynamic range limits of the channel. After the main channel signal is processed and passed through an analog to digital converter, the coded signal for each corresponding range bin is utilized to recombine a component to the attenuated signal so that the radar signal has its original amplitude modulations restored. Thus, the system allows reliable radar detection while at the same time overcoming the limitations of limited gain characteristics.

3,781,884

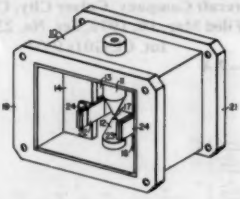
FUZE HAVING A HIGH RESISTANCE TO COUNTERMEASURES

Billy M. Horton, 9712 Rensington Pky., Kensington, Md.

Filed Apr. 23, 1958, Ser. No. 730,759
Int. Cl. G01s 9/24
U.S. Cl. 343—7 PF **13 Claims**

2. A noise-modulated radio proximity fuze comprising in combination: a transmitter radiating energy towards a target, a source of white noise having a gaussian probability distribution of amplitudes with a mean amplitude of zero and a predetermined peak-to-peak noise voltage, a linear frequency shaping network connected to said source to frequency-shape said noise to a predetermined frequency spectrum, means connecting said network to said transmitter so that the frequency-shaped noise linearly frequency modulates said transmitter, means for receiving the energy reflected from the

target, mixer means to which the received energy and a sample of the transmitted energy are fed, said mixer means producing a signal which is the instantaneous difference-frequency between transmitted and received energy and in which the frequency spectrum of the mixer output signal is dependent upon target distance amplifier means connected to the output of said mixer means for amplifying the mixer output signal, discriminator means connected to the output of



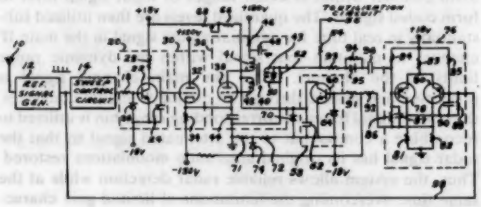
said amplifier, for producing an output signal which is a distance correlation of the frequency spectrum of the mixer output signal firing circuit means connected to the output of said discriminator means, said firing circuit means producing a firing pulse when the output of said discriminator means corresponds to a predetermined firing distance, and detonation means connected to the output of said firing circuit means so as to provide detonation when said firing circuit produces a firing pulse.

3,781,885

MOVING RANGE GATE GENERATING SYSTEM FOR RADAR APPARATUS

Lloyd J. Hassencahl, Chatsworth, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 13, 1965, Ser. No. 425,357
Int. Cl. G01s 7/28
U.S. Cl. 343—7.3 **1 Claim**



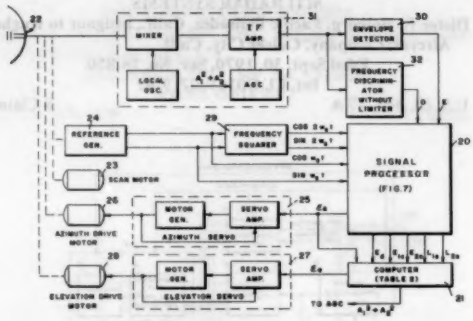
1. In a radar system for searching and tracking objects in space, a voltage comparator circuit comprising: a source of serially generated time base pulses having a predetermined pulse repetition frequency, bias means coupled to said pulse source and controlled by said pulses for deriving a control voltage extended over a predetermined duration, a first sawtooth generator biased by said control voltage to produce for said predetermined duration a sawtooth voltage encompassing a period greater in length than a plurality of periods of said pulse repetition frequency, a second sawtooth generator, multivibrator means normally having a first quiescent state and one output level and being switchable to a second state and another output level by each of said pulses, said second sawtooth generator being controlled by said multivibrator means, an input connection between said source and said multivibrator means whereby in response to the switching of said multivibrator means from said first to said second state said second sawtooth generator produces a second sawtooth voltage, a comparator having first and second input electrodes and an output electrode and characteristics of producing an output pulse on said output electrode each time the signals simultaneously applied to said input electrodes agree in amplitude, cathode follower means for applying said first sawtooth voltage to the first input electrode of said comparator, circuit means for applying said second sawtooth voltage to the second input electrode of said comparator, means connected between said output electrode and said multivibrator means for restoring the initial quiescent state of said multivibrator means upon the occurrence of said output pulses, whereby said second sawtooth voltage undergoes termination upon each reversal of said multivibrator means from said second state to said first quiescent state, the improvement lying in gradually increasing the delay between each of said output pulses and the related one of said time base pulses which spatially precedes it.

3,781,886

MULTIPLE-TARGET RESOLUTION IN THE MAIN BEAM OF A CONICAL SCAN RADAR

Gerald W. Lank, and Gerald E. Pollon, both of Claremont, Calif., assignors to Technology Service Corporation, Santa Monica, Calif.

Filed May 22, 1972, Ser. No. 255,520
Int. Cl. G01s 9/02
U.S. Cl. 343—7.4 **10 Claims**



A method is disclosed for target ray resolution in coherent, conically scanned radar when a target image is present. An envelope detector and frequency discriminator operate on the IF signal. The fundamental and second harmonic components of the conical scan out of the discriminator are used in a computer along with the DC, fundamental, and second harmonic of the envelope out of the detector to solve five equations in five unknowns. That yields the elevation angles to the target and its image. The larger of the two angles is selected as the elevation angle to the target. The first harmonic and the DC component of the envelope are employed to produce an estimate of the target azimuth angle.

3,781,887

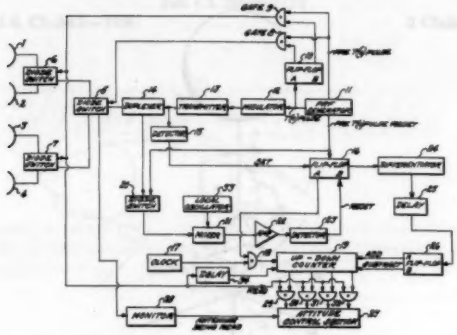
SATELLITE INSPECTION RADAR

Alfred F. Gaheen, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 14, 1967, Ser. No. 646,797
Int. Cl. G01s 9/06
U.S. Cl. 343—13 R **3 Claims**

A radar system allowing an inspecting satellite to approach another satellite within a number of feet without contact therebetween. The radar system utilizes a pair of wide-beam antennas located along the roll and pitch axes of the inspect-

ing satellite. A short pulse radar associated therewith is used to obtain range to the closest point and a comparison is made between the range measurements of each antenna in a pair. Thus a type of "sampled comparison" system is provided at a PRF/4 rate.



3,781,888

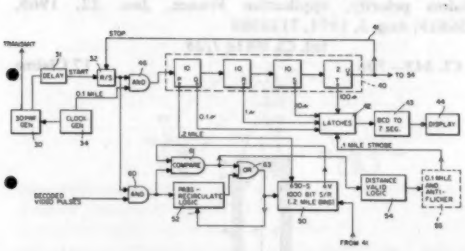
DIGITAL DISTANCE RANGING SYSTEM

John W. Bail, Fort Washington, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Oct. 30, 1972, Ser. No. 301,838

Int. Cl. G01s 9/06

U.S. Cl. 343—13 R **17 Claims**



A digital distance ranging system, particularly adapted for use in aircraft, wherein incoming pulses are converted into signals representing discrete distance ranges. During the first search cycle (epic) of a distance search, all received pulses are distance-classified within a discrete range and remembered, and during each successive epic the received pulses are distance-compared with the remembered ranges and only repeated ranges are remembered for further comparison. When only one such remembered range remains, it is identified and displayed as the valid range.

3,781,889

RADAR SIDE LOBE ECHO ELIMINATOR

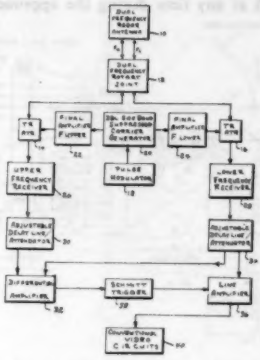
John K. Mitchell, 35 Mayfair Dr., Westwood, Mass.

Filed Mar. 21, 1972, Ser. No. 236,628

Int. Cl. G01s 9/06

U.S. Cl. 343—17.1 R **4 Claims**

An apparatus for eliminating radar side lobe echos in returning radar signals. A single antenna is utilized to simultaneously receive radar pulse echos at two different frequencies. The two frequencies have main antenna beams which are equal in width but their respective side lobes do not provide coincidence.



3,781,890

RADIO TRANSMITTER RECEIVER INCLUDING LEVEL AND ANTENNA DIRECTION CONTROL CIRCUITRY

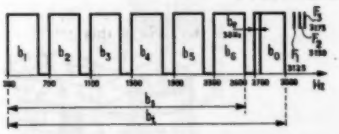
Marcel Louis Boyer, Chatillon, France, assignor to C.I.T.-Compagnie Industrielle des Telecommunication, Paris, France

Filed Nov. 20, 1970, Ser. No. 91,370

Claims priority, application France, Nov. 20, 1969, 6939969

Int. Cl. G01s 1/04

U.S. Cl. 343—100 CS **18 Claims**



The invention concerns the field of point-to-point communications in a network of stations equipped for selective calling. It concerns a coding system partially of the numerical types, partially of the analogical type, combined with a device for enabling maximum output at the transmission level. The main applications are in mobile communications, in particular, between airplanes.

3,781,891

AIRCRAFT GLIDE SLOPE INSTRUMENTATION SYSTEM

Robert R. Moose, 208 S. Henderson, Caddo, Okla.

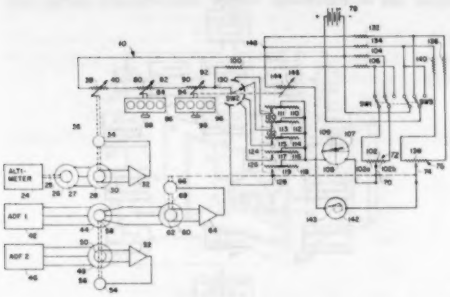
Filed Apr. 17, 1972, Ser. No. 244,830

Int. Cl. G01s 1/16

U.S. Cl. 343—108 R **14 Claims**

An aircraft glide slope instrumentation system for use with an altimeter means equipped aircraft and a landing strip, the instrumentation system comprising a pair of ground-based transmitter beacons spaced a fixed distance apart, a first direction-finding receiver carried by the aircraft for receiving the output of one of the transmitter beacons and determining the azimuth bearing thereof, a second direction-finding receiver carried by the aircraft for receiving the output of the other transmittter beacon and determining the azimuth bearing thereof, distance computer means carried by the aircraft and operably connected to the two receivers for determining the horizontal distance between the aircraft and the landing

strip based on the difference in relative bearing of the two transmitter beacons, altitude computing means carried by the aircraft and operably connected to the distance computer means for determining the desired landing approach altitude of the aircraft at any time during the approach thereof and



glide slope display means operably connected to the altitude computing means and the aircraft altimeter means for displaying the difference between the desired landing approach altitude and the true altitude of the aircraft with respect to the landing strip.

3,781,892

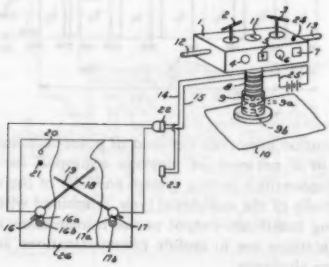
POSITION PLOTTER

George M. Holley, Jr., 510 Sheldon Rd., Grosse Pointe Shores, Mich.

Continuation-in-part of Ser. No. 889,080, Dec. 30, 1969, Pat. No. 3,623,102. This application Nov. 16, 1971, Ser. No. 199,241. The portion of the term of this patent subsequent to Nov. 23, 1988, has been disclaimed.

Int. Cl. G01s *5/08*

U.S. Cl. 343—112 PT **4 Claims**



A position plotter having a pair of bearing indicators disposed in relation to a navigation chart to show at their intersection the position of a vessel on the chart are enslaved to a pair of radio direction finders mounted on a rotatable azimuth table whereby the indicators and chart are independent of the vessel's heading when the table is rotated to a predetermined azimuth setting.

3,781,893

ANTENNA FOR WEATHER BALLOON

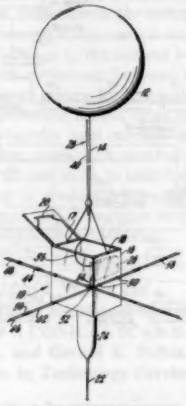
John M. Beukers, 8 Old Wood Rd., and Martin C. Poppe, 46 Pembrook Dr., both of Stoneybrook, N.Y.

Continuation-in-part of Ser. No. 873,590, Nov. 3, 1969, abandoned. This application Jan. 31, 1972, Ser. No. 222,199

Int. Cl. H01q *1/28*

U.S. Cl. 343—702 **3 Claims**

Meteorological sensing equipment is carried in an airborne vehicle. Also contained in that vehicle is a navigation receiver which receives tracking signals from a remote station and retransmits those signals, thereby to locate the position of the airborne vehicle. The present invention provides an improved antenna construction for use with the navigation receiver, that



antenna comprising a first signal-receiving conductor and a second conductor arranged with respect to the first conductor in a manner defining an artificial ground plane across which the received tracking signal is produced.

3,781,894

BALLOON CARRIED DIRECTIONAL ANTENNA

Cesar Ancona, Paris, and Jean Choquer, Gif-sur-Yvette, both of France, assignors to Centre National D'Etudes Spatiales (Cnes), Paris, France

Continuation-in-part of Ser. No. 793,082, Jan. 22, 1969, abandoned. This application Sept. 9, 1971, Ser. No. 178,910

Claims priority, application France, Jan. 22, 1968, 68136819; Aug. 3, 1971, 7128369

Int. Cl. H01q *1/28*

U.S. Cl. 343—706 **17 Claims**

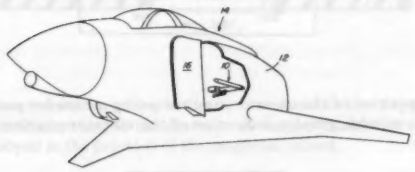
Directional antenna comprising a cylindrical skirt and a base perpendicular to the skirt axis, and a unipole extending from the base along the axis and out of the skirt. Electrically insulated fixing means extending through an aperture in the base fix the unipole to the base. A coaxial feeder line extends through the skirt and has its inner conductor extending through the insulated fixing means and connected to the unipole through the aperture and its outer conductor connected to the skirt. The unipole has a length of $\leq 0.25\ \lambda$, the skirt has a length of $0.35\ \lambda$–$0.65\ \lambda$ and a diameter of 0.05–0.2 λ, whereby the antenna has a radiation pattern which lies substantially entirely on the side of the plane of the skirt base opposed to the unipole.

3,781,895

COMBINED PITOT TUBE AND ANTENNA

George J. Monser, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 22, 1972, Ser. No. 309,312
Int. Cl. H01q 1/28
U.S. Cl. 343—708 2 Claims



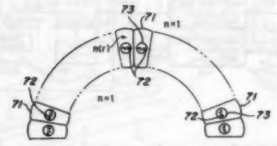
An antenna structure for use on a jet aircraft in the VHF band is shown. The particular structure illustrated is also the housing for a Pitot tube mounted on the aircraft. Such housing is electrically insulated from the fuselage of the aircraft and capacitively coupled to a coaxial transmission line so that it may become an active antenna element without affecting the aerodynamic characteristics of the aircraft.

3,781,896

ENGULFED SUPERDIRECTIVE ARRAYS

William J. Toulis, 3920 Leland St., San Diego, Calif.

Filed Nov. 12, 1969, Ser. No. 875,691
Int. Cl. H01q 19/06
U.S. Cl. 343—754 6 Claims



An array of elements which provides improved directivity characteristics when engulfed in a low-velocity refractive medium having an effective array length in the direction of propagation not exceeding any of the corresponding transverse dimensions of the engulfment.

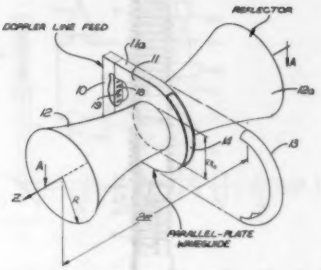
3,781,897

WIDE-ANGLE PLANAR-BEAM ANTENNA ADAPTED FOR CONVENTIONAL OR DOPPLER SCAN USING LATERALLY FLARED REFLECTOR

Gregory G. Charlton, Calabasas, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 11, 1972, Ser. No. 314,141
Int. Cl. H01q 19/10
U.S. Cl. 343—836 5 Claims

An antenna including a conductive reflector formed as a surface of revolution about a horizontal axis by rotation of a double-ended hyperbolic curve. The reflector is illuminated from an ancillary reflector in cooperation with a parallel-plate wave guide planar-beam generating arrangement. A conventional or Doppler-scan array provides the excitation for the so-called parallel-plate wave converter. The radiated beam shape



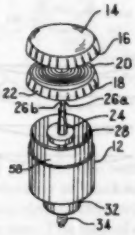
tends to hold its focus and, therefore, its elevation coordinate width over a wide range of azimuth angles.

3,781,898

SPIRAL ANTENNA WITH DIELECTRIC COVER

Albert L. Holloway, 2211 Camino A Las Cerras, Menlo Park, Calif.

Filed July 3, 1972, Ser. No. 268,823
Int. Cl. H01q 1/36
U.S. Cl. 343—872 15 Claims



A radar antenna and method of constructing the same, the antenna having a cup-like support base, a printed antenna circuit on a thin flexible dielectric blank, and an impervious cover, the antenna being constructed by stretching the dielectric blank across the open end of the support using a jig having means to engage a plurality of radially projecting tabs on the dielectric blank and drawing the tabs down against the side of the support to which they are secured before being severed from the jig, and covering the dielectric blank with the impervious cover to hermetically seal the printed antenna circuit from adverse environmental conditions.

3,781,899

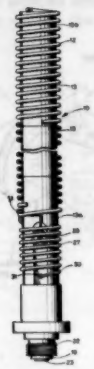
FLEXIBLE HELICAL SPRING ANTENNA

John J. Lockwood, Scottsdale, Ariz., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 17, 1973, Ser. No. 324,329
Int. Cl. H01q 1/36
U.S. Cl. 343—880 6 Claims

A flexible helical spring antenna including a helical spring member with a plurality of cylindrically shaped insulating spacers disposed centrally of the spring member to form a cen-

tral core. The spring member is stretched so as to be under tension. When the antenna is bent, the force of tension in the



spring member acting on the spacers tends to return the antenna to its normally assumed configuration.

3,781,900

LUNEBERG LENS

Keith Lewis Fuller, and Anthony John Lambell, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1972, Ser. No. 282,894

Int. Cl. H01q *15/08*

U.S. Cl. 343—911 L **5 Claims**

In a coaxial assembly of parallel, circular elements of substantially the same maximum radius, the thickness and effective dielectric constant of each element at each radius from zero to the maximum, and the spacing of the elements, are such that the assembly acts as a cylindrical Luneberg lens. Suitably, each element has the same dimensions and is of the same dielectric material, and the elements are regularly spaced.

The varying thickness of each element enables the assembly of spaced elements to satisfy a desired relation between equivalent dielectric constant and radius. The lens is suitable for high-power applications.

3,781,901

METHOD FOR EVALUATING ELEVATOR PERFORMANCE

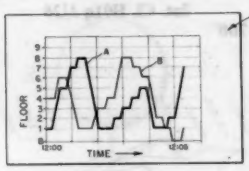
Evans Lewis Morrison, 510 Narberth Ave., Merion, Pa.

Filed Mar. 14, 1972, Ser. No. 234,630

Int. Cl. G01d *9/12*

U.S. Cl. 346—1 **3 Claims**

A process for evaluating elevator performance wherein a continuous signal, corresponding to the position of the elevator, is produced and recorded in the form of a visual graphic indication of the position of the elevator with time. An apparatus for continuously indicating and recording the position of an elevator with time, said apparatus comprising signal means connected to a part of the elevator operating assembly and adapted to provide a continuous signal corresponding to



the position of the elevator, and recording means for producing a suitable graphic indication of the elevator position with time.

3,781,902

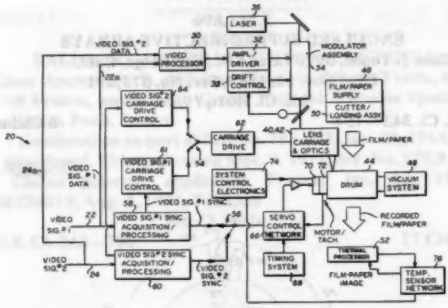
RECORDER/PROCESSOR APPARATUS

Ivan H. Shim, Fairfield, and John J. Stelben, Greenwich, both of Conn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 7, 1971, Ser. No. 177,985

Int. Cl. G01d

U.S. Cl. 346—24 **25 Claims**



An apparatus for recording a data input on, and thermally processing, a thermally processible storage medium in which a light source, such as a modulated laser beam whose intensity is modulated in response to the incoming data input, such as a video signal, is caused to generate a raster in conformance with incoming timing/control signals so as to expose a latent image of the input information on the storage medium. A rotating drum in conjunction with an incrementally driven lens carriage associated with the laser optical system provides the raster generation. The drum is automatically loaded with the storage medium from a supply means and automatically unloaded to a thermal processor upon completion of recording. The latent image is processed by the controlled application of heat so as to produce an actual displayable image corresponding to the data input at the output of the apparatus.

3,781,903

MAGNETIC IMAGING METHODS AND MEDIA

Frederick J. Jeffers, and John H. Rolker, both of Altadena, Calif., assignors to Bell & Howell Company, Chicago, Ill.

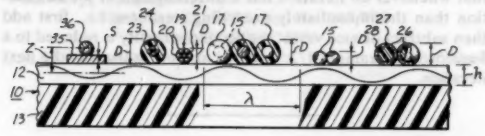
Filed Nov. 8, 1971, Ser. No. 196,317

Int. Cl. G03g *19/00*

U.S. Cl. 346—74 MP **46 Claims**

A magnetic imaging method provides a magnetic record of an input image by causing selected portions of a sheet of mag-

netic recording material to be magnetized substantially to a predetermined depth with alternating magnetic fields having a



predetermined wavelength that is correlated to the depth of magnetization and to the diameter of magnetic toner particles employed in the printout of the magnetic record.

3,781,904

APPARATUS FOR PRODUCING RASTER DOT IMAGES

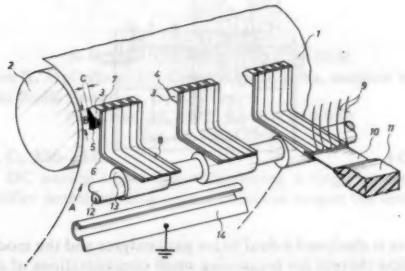
Fritz Firnig; Hubertus Bettin, and Gunter Lorenzen, all of Braunschweig, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Feb. 2, 1972, Ser. No. 222,961

Claims priority, application Germany, May 12, 1971, P 21 23 558.5

Int. Cl. G01d *15/08*

U.S. Cl. 346—74 SB **7 Claims**



An apparatus for producing images with raster dots on a recording carrier. The recording carrier has a coating which can be modified by writing electrodes to which an electrical voltage can be applied. A transporting member is used to move the recording carrier relative to the writing electrodes. An oscillator imparts an oscillating movement to the writing electrodes, each writing electrode sweeping over a respective area corresponding in size to a raster dot.

3,781,905

OPTICAL MASS MEMORY

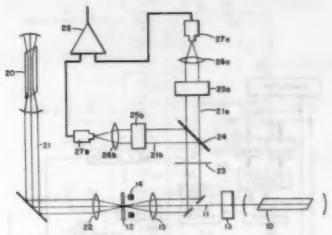
Enrique Bernal G., and Di Chen, both of Minetonka, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 22, 1972, Ser. No. 291,448

Int. Cl. G11b *5/02*

U.S. Cl. 346—74 MT **11 Claims**

An optical mass memory of the Curie point writing type which utilizes a pulsed laser to write on low temperature phase manganese bismuth film. The duration of the laser pulses is less than 10 nanoseconds. Greatly reduced readout signal



level variation due to crystallographic phase change is achieved.

3,781,906

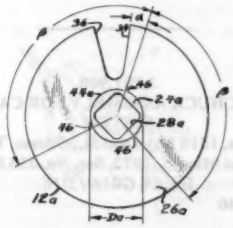
MULTIPLE DAY RECORDING CHART PACK

Murray C. Carney, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed June 28, 1971, Ser. No. 157,589

Int. Cl. G01d *15/32*

U.S. Cl. 346—137 **15 Claims**



A multiple day chart pack for use with tachographs and the like which includes a plurality of stacked charts each of which has an inner disc portion detachably secured to an outer portion through breakable ties. The ties of each chart in the pack are positioned to require equal tie severing torque between successive charts. The tie circle of each chart in the pack is greater than the diameter of the tie circle of the next preceding chart to preclude restraint or interference with movement of a chart axially over the inner disc portions of the next preceding charts after recording thereon.

3,781,907

APPARATUS FOR EXPRESSING WRITING FLUID FROM A PLOTTING PEN

Heinz Joseph Gerber, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

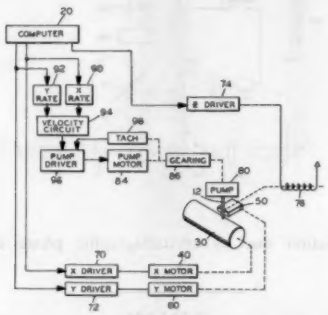
Filed Jan. 17, 1972, Ser. No. 218,143

Int. Cl. G01d *15/16*

U.S. Cl. 346—140 **10 Claims**

In a plotting device in which a plotting pen and a recording medium move relative to one another while the pen produces a line trace on the medium, a fluid pump is connected to the plotting pen and forcibly expresses writing fluid from the pen at a rate proportional to the rate of relative movement between the pen and the recording medium. In one such plotting device, a recording medium such as a strip of plotting paper, is transported between two supply rolls by means of a motor-driven plotting drum. The plotting pen is transported

laterally of the strip of plotting paper and over the plotting drum by means of a motor-driven carriage. The motors of the plotting drum and the carriage receive plotting commands from a digital computer and a velocity signal circuit in the



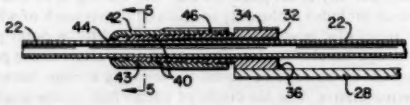
plotting device derives a velocity signal proportional to the relative movement generated by the motors. The velocity signal is utilized to control the speed of the fluid pump which is specially constructed to have a linear speed versus flow rate characteristic.

3,781,908

ADJUSTABLE CHUCK ASSEMBLY FOR CAPILLARY PEN SYSTEM

Aubrey R. Tullos, 1510 Haywood St., Odessa, Tex.

Filed May 15, 1972, Ser. No. 253,009
Int. Cl. G01d *15/16*
U.S. Cl. 346—140 **7 Claims**



The disclosure includes an incrementally adjustable chuck assembly mount for an inking pen on the end of a recorder arm of a recorder apparatus. The mounting provides an infinite number of possible settings for the pen while permitting easy replacement with another pen.

3,781,909

REDUCED ITERATION IN COMPUTER COLOR MATCHING

Edwin Ira Stearns, Westfield, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 15, 1971, Ser. No. 124,478
Int. Cl. G06f
U.S. Cl. 235—150 **2 Claims**

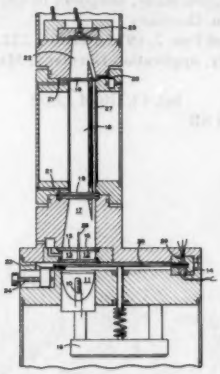
Digital computer color matching of a plurality of colorants to a target color involves usually repeated iterations in computing the final match. Excessive number of iterations results when the computation first shows that a certain amount of color must be added to the formula and in the next iteration a certain amount subtracted. There is described an improved method and programmed computer for reducing iterations under such circumstances by programming the computer so that whenever an iteration has a different sign in the calculation than the immediately preceding iteration, i.e., first add then subtract or vice versa; the second quantity is reduced to a fraction, for example 1/2. and this amount is used in the next iteration.

3,781,910

INFRARED ABSORPTION ANALYSIS METHOD AND APPARATUS FOR DETERMINING GAS CONCENTRATION

Pierre Herrmann, Fontenay-aux-Roses, France, assignor to Compteurs Schlumberger, Montrouge, France

Filed Sept. 22, 1972, Ser. No. 291,379
Claims priority, application France, Sept. 28, 1971, 7134767
Int. Cl. G01n *21/34*
U.S. Cl. 250—341 **3 Claims**



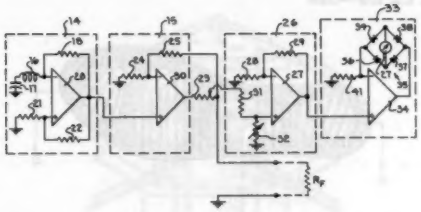
There is disclosed a dual beam gas analyzer and the mode of operation thereof for measuring small concentrations of a gas of interest in the presence of another gas having absorption bands overlapping those of the gas of interest. This is encountered in the determination of the concentration of CO_2, CO, CH_4, C_2H_2, NH_3 or SO_2 in the presence of CH_4, CO_2, CO_2, CO_2 or CH_4 respectively. The dual beam gas analyzer comprises a source of infrared rays providing an infrared beam which is directed into one end of an analysis chamber through an optical commutator. The optical commutator directs alternately and periodically the infrared beam to a comparison filter transparent to the infrared beam and to a gaseous filter absorbing completely the energies of the absorption bands of the gas to be measured. The output signals of a non-selective radiation detector disposed at the other end of the analysis chamber are applied to electronic circuits which provide a signal representative of the difference between the energies of the two successive beams passing through the analysis chamber. A movable shutter permits one to modify the energy of the beam corresponding to the comparison filter and is adjusted to eliminate the influence of the other gas on the determination of the concentration of the gas of interest. According to one embodiment an auxiliary tube is placed along the path of the beam passing through the gaseous filter to increase the precision of the gas analyzer in cases where the concentrations to be measured are in the range of a few tens ppm.

3,781,911

APPARATUS FOR MONITORING THICKNESS OF EVAPORATED FILM

James J. Davidson, West Lafayette, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1973, Ser. No. 343,772
Int. Cl. G01r 27/02
U.S. Cl. 324—65 R 3 Claims



An apparatus for monitoring the thickness of a film as it is evaporated onto a substrate having a signal applicator for maintaining a voltage across the film. An oscillator is used to provide a constant voltage to the signal applicator and the resulting current through the film is measured across a series resistor by a differential amplifier. The output from the differential amplifier is connected to a detector and visual indicator.

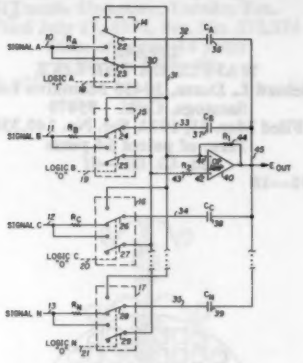
3,781,912

N-WAY ANALOG SIGNAL FADER

James H. McCollum, Jr., Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Dec. 29, 1972, Ser. No. 319,959
Int. Cl. H03f 3/00
U.S. Cl. 330—51 4 Claims

A DC analog signal fader employing a single operational amplifier permits fading onto a common output the level of a selected one of a plurality of input signals. A newly selected signal is faded from the level of a next previously selected input and in a manner which does not introduce lag or step level changes at the output.

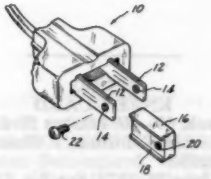


3,781,913

ELECTRICAL SAFETY BLOCK

Frank A. Liburdi, 4629 Burssens, Warren, Mich.

Filed June 8, 1972, Ser. No. 260,908
Int. Cl. H01r 13/52
U.S. Cl. 339—37 3 Claims

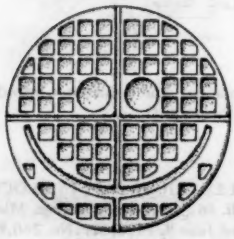


A device adapted for attachment to one of the male prongs of an electrical plug to prevent insertion of the plug into an electrical receptacle.

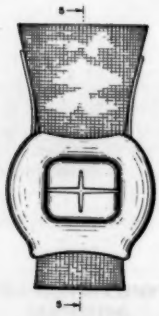
DESIGNS

DECEMBER 25, 1973

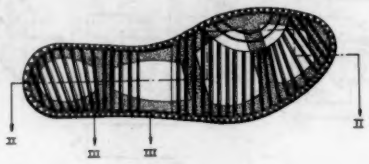
229,642
WAFFLE OR THE LIKE
Richard L. Dorsa, 20450 Montalvo Lane, Saratoga, Calif. 95070
Filed Mar. 31, 1972, Ser. No. 240,338
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—18



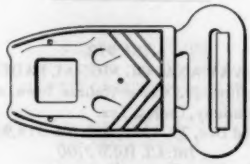
229,643
KNEE GUARD
Daniel Bednarczuk, 37—04 Parsons Blvd., Flushing, N.Y. 11354, and Arnold T. Milton, 7 Olmsted Road, Scarsdale, N.Y. 10583
Filed June 10, 1971, Ser. No. 152,018
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27



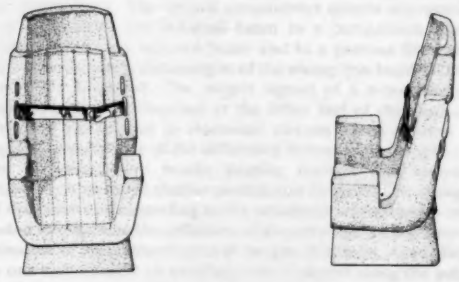
229,644
SHOE SOLE
Helge Persson, Ekstubbevagen 6, S–260 40 Viken, Sweden
Filed Jan. 14, 1972, Ser. No. 218,047
Term of patent 7 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



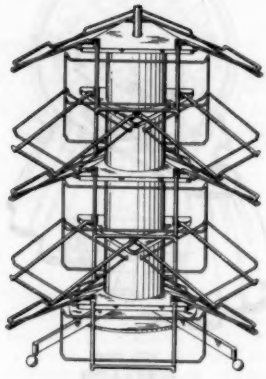
229,645
BUCKLE FOR SAFETY BELTS
Gote Eskil Yngve Holmberg, P.O. Box 2010, S–330 20, Anderstorp, Sweden
Filed Aug. 24, 1971, Ser. No. 174,583
Claims priority, application Sweden Feb. 8, 1971
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—408



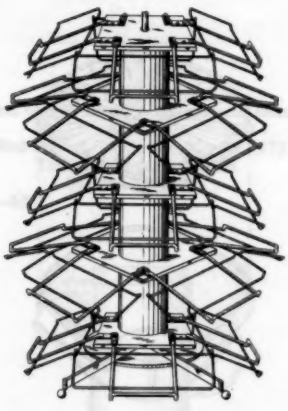
229,646
CHILD'S CAR SEAT
Lawrence Blazey, Bay Village, David Silverstrom, Lyndhurst, and Elmer Rocker, Shaker Heights, Ohio, assignors to Century Products, Inc., Cleveland, Ohio
Filed Feb. 7, 1972, Ser. No. 224,403
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



229,647
DISPLAY STAND FOR FLAT ARTICLES
Fred Howard, New York, and David O'Neill, Long Island City, N.Y., assignors to Howard Displays, Inc., New York, N.Y.
Filed June 28, 1972, Ser. No. 266,994
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



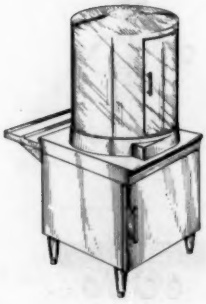
229,648
DISPLAY STAND
Fred Howard, New York, and David O'Neill, Long Island City, N.Y., assignors to Howard Displays, Inc., New York, N.Y.
Filed June 28, 1972, Ser. No. 266,993
Int. Cl. D20—*02*
Term of patent 14 years
U.S. Cl. D6—24



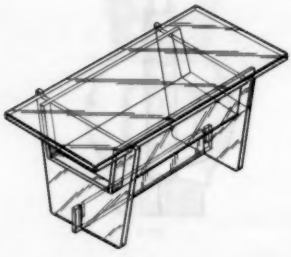
229,649
DISPLAY RACK
Richard R. Garcia, Laredo, Tex., assignor to Miracle Candle Company, Laredo, Tex.
Filed July 17, 1972, Ser. No. 272,374
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—25

229,650
STAND FOR HOUSEHOLD PAPER ROLLS
Arne Nils Christian Sonnergaard, Lidingo, Sweden, assignor to AB Automatic, Stockholm, Sweden
Filed Apr. 13, 1972, Ser. No. 243,922
Claims priority, application Canada Feb. 24, 1972
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—97

229,651
MODULAR DISPLAY UNIT
Louis J. Corini, Philadelphia, Pa., assignor to Melbro Corporation, Philadelphia, Pa.
Filed Apr. 13, 1972, Ser. No. 243,923
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—171

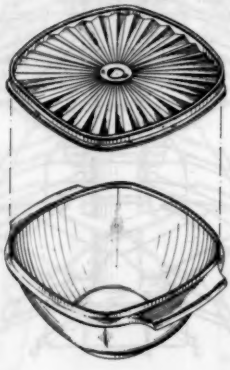


229,652
TABLE
Barton E. Brooke, Jr., % Allied Industries, 524 Washington St., Chagrin Falls, Ohio 44022
Filed Mar. 24, 1972, Ser. No. 238,010
Term of patent 3½ years
Int. Cl. D6—*03*
U.S. Cl. D6—175

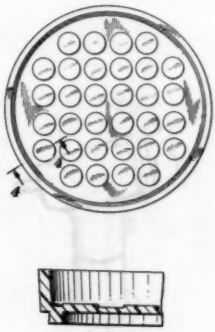


229,653
APPLIANCE COVER
Ruth F. Hendrickson, 638 Continental Road, Hatboro, Pa. 19040
Filed Sept. 27, 1971, Ser. No. 184,320
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—269

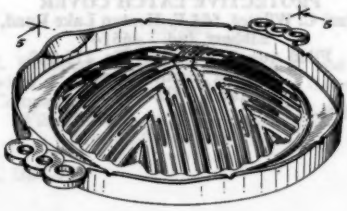
229,654
COMBINED SERVING BOWL AND CLOSURE OR THE LIKE
Jack V. Croyle, Woonsocket, and Harold P. Ashton, Providence, R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed July 22, 1971, Ser. No. 165,433
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—18



229,655
COASTER
Gunnar Cyren, Gavle, Sweden, assignor to Dansk Designs Ltd., Mount Kisco, N.Y.
Filed Nov. 1, 1972, Ser. No. 302,968
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45

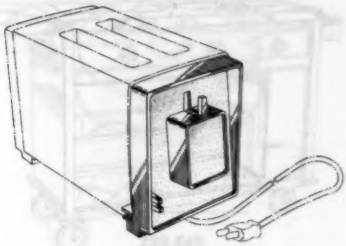


229,656
ROASTER
Humberto A. Garcia, Calle 80 7–67, Bogota, Columbia
Filed Mar. 1, 1972, Ser. No. 231,057
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—64



229,657
PITCHER
Gunnar Cyren, Gavle, Sweden, assignor to Dansk Designs Ltd., Mount Kisco, N.Y.
Filed Nov. 1, 1972, Ser. No. 302,972
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—65

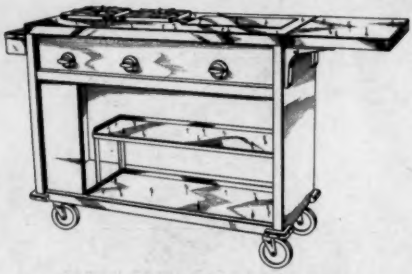
229,658
TOASTER END PANEL WITH CORD STORAGE
Berton R. Oxel, Louisville, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed June 23, 1972, Ser. No. 265,824
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—93



229,659
FISH CLEANING TOOL
Leo R. Murnan, 4404 Woolworth St., Omaha, Nebr. 68105
Filed Mar. 24, 1972, Ser. No. 238,019
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—106

229,660
BARBECUE COOKER
William A. Gammon, 3339 N. Meridian St., Indianapolis, Ind. 46208
Filed Aug. 26, 1971, Ser. No. 175,418
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

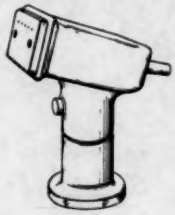
229,661
MOBILE COOKING CART
Theodore C. Lambertson, 1369 Rollins Road, Burlingame, Calif. 94010
Filed Oct. 13, 1971, Ser. No. 189,068
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—108



229,662
KNIFE
Harry Friedman, Franklin Lakes, N.J., assignor to Jet-Acr Corporation, Paterson, N.J.
Filed Sept. 7, 1972, Ser. No. 286,982
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—150

229,663
WHEELED DUAL-ACCESS CLOTHES HAMPER
Robert Y. Morita, 1268 Lyman Place, Los Angeles, Calif. 90029
Filed Dec. 6, 1972, Ser. No. 312,604
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D7—163

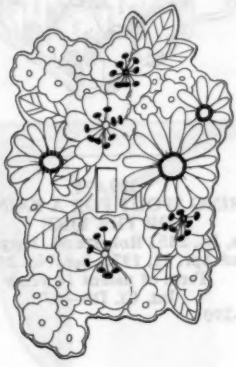
229,664
PORTABLE STEAMER
Franz Alban Stutzer, Muhlheim am Main, Germany, assignor to Rowenta-Werke G.m.b.H., Offenbach am Main, Germany
Filed Feb. 23, 1972, Ser. No. 228,788
Claims priority, application Germany Aug. 30, 1971
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—164



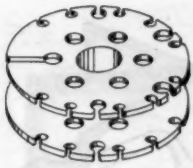
229,665
PROTECTIVE LATCH COVER
Paul C. Wilmot, 505 E. Heaton Lake Road, Elkhart, Ind. 46514
Filed Aug. 9, 1972, Ser. No. 279,009
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—137

229,666
APPLIANCE HANDLE
Paul F. Frawley, Georgetown, Ontario, Canada, assignor to John Inglis Co. Limited, Toronto, Ontario, Canada
Filed July 21, 1972, Ser. No. 273,821
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—169

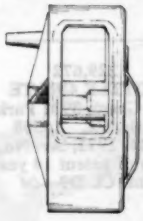
229,667
WALL PLATE
Paul E. Rochford, East Greenwich, R.I., and Frances Neuwirth, New York, N.Y., assignors to General Electric Company
Filed June 23, 1972, Ser. No. 265,687
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—182



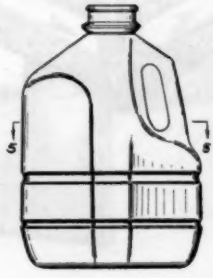
229,668
REEL FOR HOLDING ELECTRIC WIRE
Edgar Boone, 15 Walt Whitman Road, Huntington Station, N.Y. 11746
Filed Sept. 22, 1972, Ser. No. 291,197
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220



229,669
PORTABLE WIRE REELS
Frank J. Boyce, Windsor, N.Y., assignor to Stow Manufacturing Company, Binghamton, N.Y.
Filed Dec. 22, 1972, Ser. No. 317,734
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—222

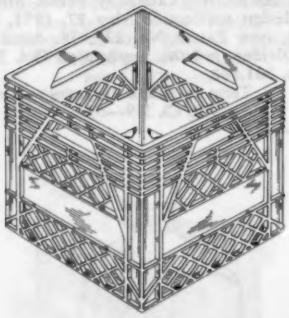


229,670
JUG
Richard L. Platte, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Original design application May 17, 1971, Ser. No. 144,381, now Patent No. 227,078, dated June 5, 1973. Divided and this application Oct. 27, 1972, Ser. No. 301,608
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40



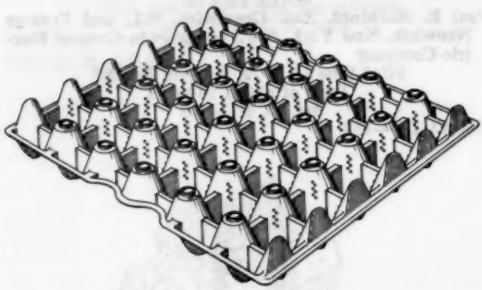
229,671
BOTTLE
James G. Nelson, Fullerton, Calif., assignor to Gold Seal Vineyards, Inc., New York, N.Y.
Filed June 19, 1972, Ser. No. 264,210
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—47

229,672
BOTTLE CRATE
John D. Van Geem, 3931 Parkside Ave., Erie, Pa. 16508
Filed Sept. 16, 1971, Ser. No. 181,286
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—177



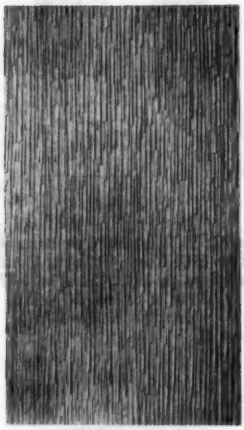
229,673
LEAD BOX
William E. Danjczek, Easton, Pa., assignor to Koh-I-Noor Rapidograph, Inc., Bloomsburg, N.J.
Filed July 28, 1971, Ser. No. 167,089
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

229,674
EGG TRAY OR THE LIKE
Donald J. Quigg, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed June 10, 1971, Ser. No. 152,002
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190

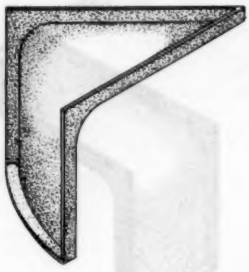


229,675
POURING SPOUT FOR A PAINT CAN OR THE LIKE
Frank Kuncz, Jr., 2453 Roberta St., Largo, Fla. 33540
Filed Apr. 21, 1972, Ser. No. 251,605
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—290

229,676
DECORATIVE PANEL OR SIMILAR ARTICLE
Robert George Koch, Turnersville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Filed June 7, 1971, Ser. No. 150,491
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



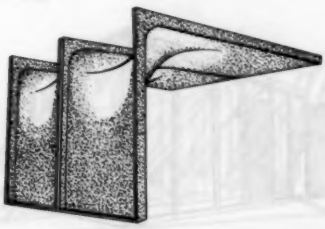
229,677
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,195
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



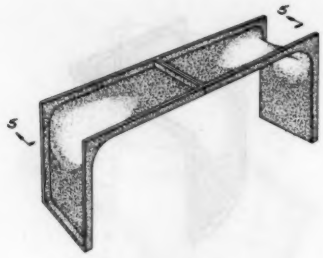
229,678
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,196
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

229,679
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,197
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

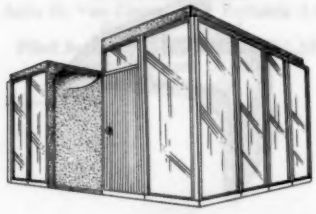
229,680
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,202
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



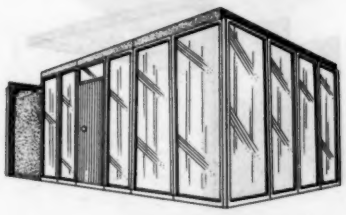
229,681
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,203
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



229,682
HOUSE
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,204
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

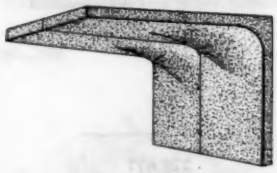


229,683
HOUSE
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,205
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

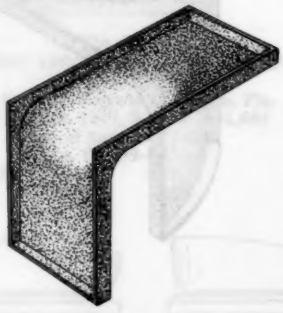


229,684
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,206
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

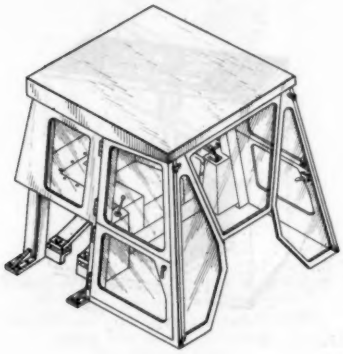
229,685
HOUSING MODULE
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,207
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 R

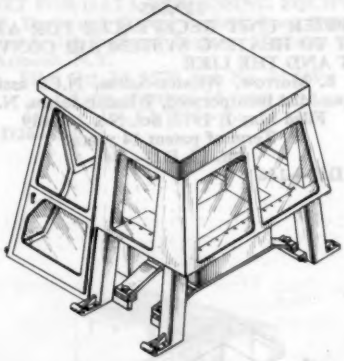


229,686
ARCHITECTURAL UNIT
Mark L. Hildebrand, Altadena, Calif.
(157 Bowers Hill Road, Oxford, Conn. 06483)
Filed Sept. 1, 1971, Ser. No. 177,216
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J



229,687
TRACTOR CAB
John H. Babbitt, Jr., and Ronald G. Boyer, Peoria, Arthur E. Olt, Jr., Perkin, Paul E. Schuck, Canton, and Sheldon L. Stark, Eureka, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Oct. 2, 1972, Ser. No. 294,233
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—27 B

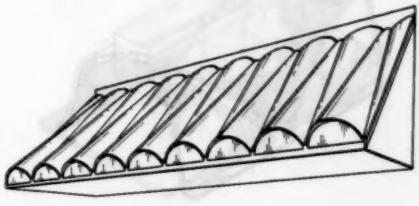




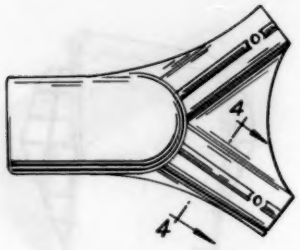
229,688
SECURITY PARTITION FOR POLICE VEHICLES
Karl G. Feth, 4258 Elm Park Drive, St. Louis County, Mo. 63128
Filed Oct. 26, 1970, Ser. No. 25,675
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6

229,689
CELL CULTURE VESSEL OR THE LIKE
Robert Dragotta, Vineland, N.J., assignor to Bio-Research Glass, Inc., Vineland, N.J.
Filed Jan. 12, 1973, Ser. No. 323,128
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1 R

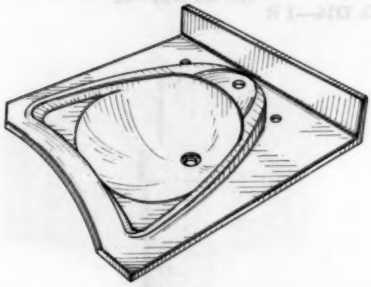
229,690
STOREFRONT AWNING
Winston F. Bott, 1915 N. Lexington Blvd., Corpus Christi, Tex. 78409
Filed May 11, 1972, Ser. No. 252,523
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D21—6 B



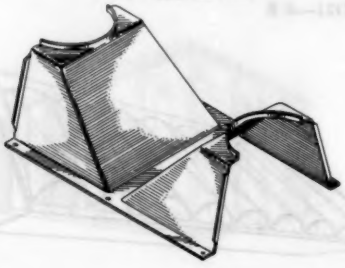
229,691
FISHING NET YOKE
James D. Maxwell, 11001 SE. 19th, Vancouver, Wash. 98664
Filed Apr. 12, 1971, Ser. No. 133,458
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22



229,692
LAVATORY
Richard J. Ganger, Los Angeles, Calif., assignor to Gruber Systems, Inc., North Hollywood, Calif.
Filed Nov. 18, 1971, Ser. No. 196,873
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

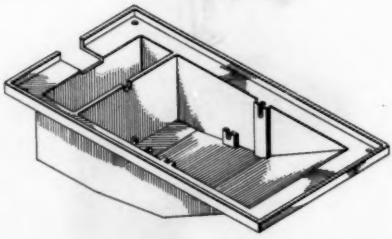


229,693
AIR SCOOP COVER FOR A HUMIDIFIER UNIT
William B. Morrow, Winston-Salem, N.C., assignor to Aqua-Mist Incorporated, Winston-Salem, N.C.
Filed May 1, 1972, Ser. No. 249,487
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

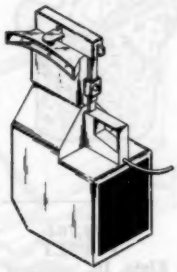


229,694
TOP PANEL FOR ELECTRIC HUMIDIFIER
Jack B. Schmitt, Los Angeles, Calif., assignor to Sunbeam Corporation, Chicago, Ill.
Filed July 5, 1972, Ser. No. 270,801
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

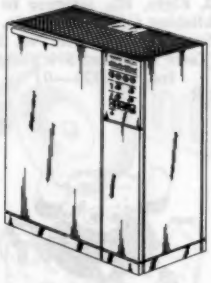
229,695
HUMIDIFIER UNIT RECEPTACLE FOR ATTACHMENT TO HEATING SYSTEM AIR CONVEYING DUCT AND THE LIKE
William B. Morrow, Winston-Salem, N.C., assignor to Aqua-Mist Incorporated, Winston-Salem, N.C.
Filed May 1, 1972, Ser. No. 249,489
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146



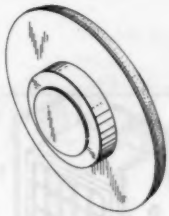
229,696
TOILET STOOL AIR DEODORIZER
Robert L. Stevenson, 7320 W. 87th St., Overland Park, Kans. 66212
Filed Aug. 2, 1972, Ser. No. 277,902
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



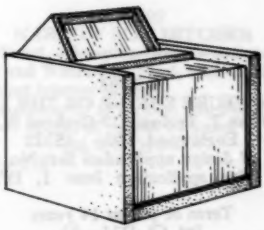
229,697
CABINET FOR DATA PROCESSING EQUIPMENT
Myron F. Davis and Walter Furlani, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 26, 1970, Ser. No. 25,659
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



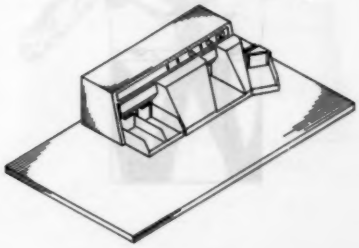
229,698
SEPARABLE MAGNETIC HOLDER FOR SHEET-LIKE MATERIAL
Erich Kretzer, Neunkirchen, Germany, assignor to Walter Hebel Hammanditgesellschaft, Kirchen, Sieg, Germany
Filed June 21, 1971, Ser. No. 155,369
Claims priority, application Germany Dec. 19, 1970
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D26—1 M



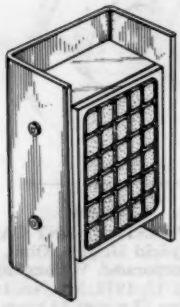
229,699
FLIP-TOP INSTRUMENT CABINET
Allen B. Hehs, Mayfield Heights, Ohio, assignor to Bud Radio Incorporated, Willoughby, Ohio
Filed May 12, 1971, Ser. No. 142,848
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D26—5 C



229,700
DATA RECORDER
Thomas L. Richardson, Horsham, Bruno Kersten, Springfield, and Charles T. Johnson, Philadelphia, Pa., assignors to Decision Data Computer Corporation, Warminster, Pa.
Filed Sept. 27, 1971, Ser. No. 184,331
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



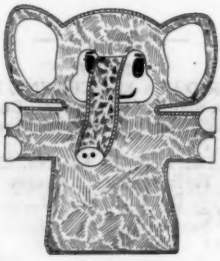
229,701
SPEAKER ENCLOSURE
Robert W. Becker, Naperville, and Melvin H. Boldt, Glenview, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Apr. 27, 1973, Ser. No. 354,963
Term of patent 7 years
Int. Cl. D14—*01*; D31
U.S. Cl. D26—14 G



229,702
MINIATURE SHRINE OR THE LIKE
John T. Torlone, 37 Orchard St., Englewood, Ohio 45322
Continuation of design application Ser. No. 22,081, Mar. 27, 1971. This application June 1, 1971, Ser. No. 144,703
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A

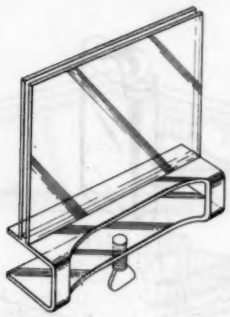
229,703
PUPPET
Russell B. Odell, Elgin, Ill., assignor to David C. Cook Publishing Company, Elgin, Ill.
Filed Sept. 11, 1972, Ser. No. 287,613
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

229,704
PUPPET
Russell B. Odell, Elgin, Ill., assignor to David C. Cook Publishing Company, Elgin, Ill.
Filed Sept. 11, 1972, Ser. No. 288,139
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

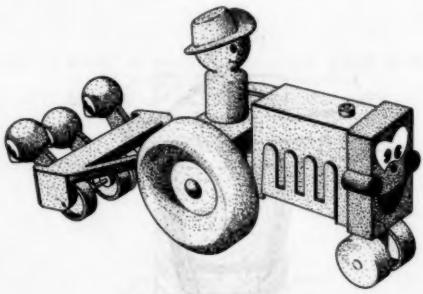


229,705
PUPPET
Russell B. Odell, Elgin, Ill., assignor to David C. Cook Publishing Company, Elgin, Ill.
Filed Sept. 11, 1972, Ser. No. 288,145
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

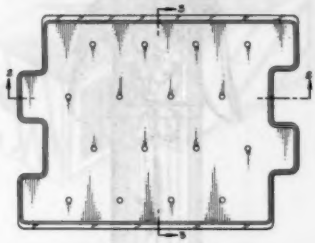
229,706
CARD GAME SCORE HOLDER FOR ATTACHMENT TO TABLE CORNER
Scott Lewis, 37 Shore Road, Ogunquit, Maine 03907
Filed Aug. 13, 1971, Ser. No. 171,788
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A



229,707
COMBINED TOY TRACTOR AND PLOW
Gerald W. Schmidt, Woodland Hills, and Anson Sims, Redondo Beach, Calif., assignors to California R & D Center, Pacific Palisades, Calif.
Filed Mar. 2, 1972, Ser. No. 231,441
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AN

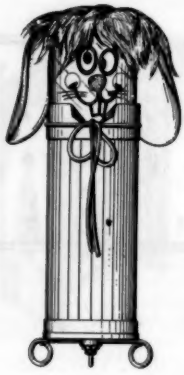


229,708
TRAY FOR PREPARING SEED PROPAGATION
Charles Dugan-Chapman, London, England, assignor to Steward Plastics Limited, Croydon, Surrey, England
Filed Sept. 17, 1971, Ser. No. 181,649
Claims priority, application Great Britain July 20, 1971
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D35—3 A



229,709
NARROW SLIT DITCHER
Walter P. Winsett, Memphis, Tenn., assignor to Marion H. Winsett and William E. Ford, both of Houston, Tex., fractional part interest to each
Filed June 2, 1971, Ser. No. 149,406
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1 B

229,710
LAMP
Samuel M. Pambello, 316 Bloomfield Ave., Hoboken, N.J. 07030
Filed Sept. 15, 1971, Ser. No. 180,952
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 B

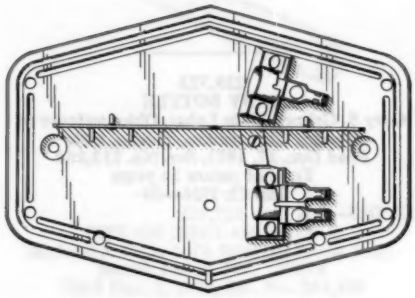


229,711
LAMP FIXTURE
Richard B. Poff, 743 N. Main St., Auburn, Ind. 46706
Filed Dec. 13, 1971, Ser. No. 207,727
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

229,712
CIGARETTE LIGHTER
Jerome P. Vogel, Woodland Hills, Calif., assignor to Lindy Pen Company, Incorporated
Filed Sept. 5, 1972, Ser. No. 286,619
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R

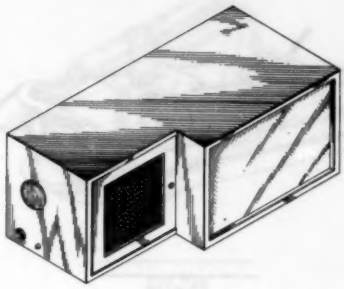
229,713
LUMINAIRE
Vearl S. Wince, South Newark, Ohio, and Mitchell Bobrick, Los Angeles, Calif., assignors to Holophane Company, Inc., New York, N.Y.
Continuation-in-part of abandoned design application Ser. No. 19,358, Oct. 1, 1969. This application June 22, 1970, Ser. No. 24,258
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

229,714
BODY FOR MULTI-PURPOSE RECREATIONAL VEHICLE LIGHT
George A. Knapp, Dewitt, Edward J. Nitsch, Camillus, Fred F. Stube, Syracuse, and Ernest R. Steltzer, Lysander, N.Y., assignors to R. E. Dietz Company, Syracuse, N.Y.
Filed Mar. 10, 1972, Ser. No. 233,854
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 C

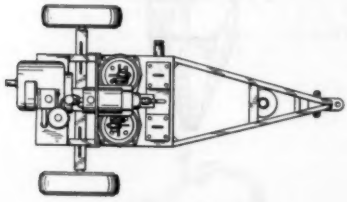


229,715
ADJUSTABLE DIAL ANGLE METER
Frank A. Nowak, 3550 Flower St., Santa Maria, Calif. 93454
Filed June 29, 1972, Ser. No. 267,430
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6 R

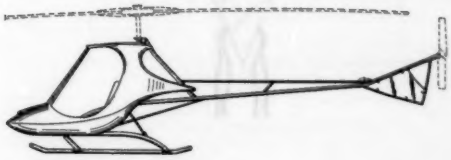
229,716
REAR PROJECTION VIEWER
Carl S. Shirley, Alexandria, Va., assignor to General Educational Technology Corporation, Alexandria, Va.
Filed Nov. 6, 1972, Ser. No. 303,763
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 N



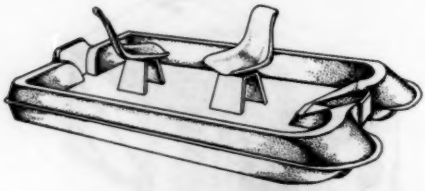
229,717
MOBILE DOUBLE DIAPHRAGM PUMP OR THE LIKE
James A. Mixon, 4063 Salisbury Road, Jacksonville, Fla. 32216
Filed July 13, 1971, Ser. No. 162,319
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1 A



229,718
HELICOPTER FUSELAGE
Buford J. Schramm, 14805 S. Interstate 10, Tempe, Ariz. 85281
Filed Oct. 15, 1971, Ser. No. 189,802
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1 J

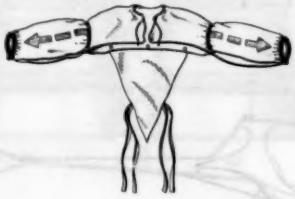


229,719
TWIN HULL BOAT
Richard B. Hull, % Midland Fiberglass Company, Box 5714, Midland, Tex. 79701
Filed Feb. 28, 1972, Ser. No. 230,208
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q



229,720
SENSOR HOUSING FOR AN ALARM SYSTEM
Lloyd R. Bound, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Mar. 23, 1972, Ser. No. 237,598
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D72—1 A

229,721
SIGNALING GARMENT
Sylvia Anita Hatton, 6246 N. 15th St., Philadelphia, Pa. 19141
Filed Dec. 18, 1972, Ser. No. 316,074
Term of patent 14 years
Int. Cl. D29—*02*; D2—*02*
U.S. Cl. D72—1 E

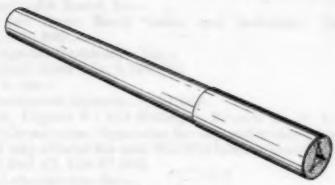


229,722
COMBINED STYLUS AND INK RESERVOIR
Mickey L. Felton, Hamilton County, Ind., assignor to Esterline Corporation, New York, N.Y.
Filed Sept. 9, 1971, Ser. No. 179,259
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17 B

229,723
BABY BOTTLE
Gary S. Grimes, Twin Lakes, Ohio, assignor to Questor Corporation, Toledo, Ohio
Filed Dec. 27, 1971, Ser. No. 212,864
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—8 A

229,724
SURGICAL CLAMP OR SIMILAR ARTICLE
Richard E. Ericson, Keene, N.H., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed Sept. 2, 1971, Ser. No. 177,531
Term of patent 14 years
Int. Cl. D24
U.S. Cl. D83—12 R

229,725
FILTERED CIGARETTE
Richard M. Berger, Richmond, Va., assignor to American Filtrona Corporation, Richmond, Va.
Filed June 21, 1971, Ser. No. 155,371
Term of patent 14 years
Int. Cl. D27—*01*
U.S. Cl. D85—6 C



229,726
PIPE OR SIMILAR DEVICE
Richard J. Finn, 1870 Winding Brook Way, Scotch Plains, N.J. 07076
Filed Dec. 2, 1971, Ser. No. 204,399
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D85—8 A

229,727
SEWING MACHINE CARRYING CASE OR SIMILAR ARTICLE
Donald M. Genaro, Haworth, N.J., assignor to The Singer Company, New York, N.Y.
Filed Apr. 9, 1971, Ser. No. 132,925
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R

229,728
CANE
Morton I. Thomas, Monroe, N.Y. (125 South St., Passaic, N.J. 07055)
Filed Nov. 23, 1971, Ser. No. 201,631
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D88—4

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF DECEMBER, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O, Inc.: *See—*
McGill, Robert W.; and Painter, P. Eric, 3,780,628.

A-T-O Inc., mesne: *See—*
Rosenfeld, Howard; and Wetzler, Justin J., 3,780,543.

AB Hagglund & Soner: *See—*
Edlund, Sven Bertil Gosta; and Sodersten, Bo Frans Ake, 3,780,990.

AB Ljungmans Verkstader: *See—*
Eklund, Hans Eric, 3,780,776.

AB UVA: *See—*
Gluchowicz, Gerszon, 3,781,069.

Abarotin, Eugene V.; and Bollinger, Edward R., Jr., to United States Steel Corporation. Apparatus for adjustably mounting a tester transducer ring around the pass line of a tubular product processing mill. 3,781,663, Cl. 324-37.000.

Abbott Laboratories: *See—*
Banford, John Alexander, 3,780,737.
Flouret, George Rogelio, 3,781,272.

Abex Corporation: *See—*
Wilcox, Jack W., 3,781,145.

Abler, Norman C.; and Hardt, David R., to Faustel Incorporated. Doctor blade assembly. 3,780,670, Cl. 101-363.000.

Abramson, Paul B.; and McConnell, Robert G. Digital timing system. 3,781,529, Cl. 235-92.0ga.

ACF Industries, Incorporated: *See—*
Kemp, Willard E., 3,780,982.
Lindberg, Allen W., 3,780,711.

ACI Operations Pty. Limited: *See—*
Corderoy, Henry Morgan, 3,780,492.

Acre, Thomas R.; Gimbel, Frederick M.; and Ramacheandran, Sundaresan, to Allegheny Ludlum Industries, Inc. Method and apparatus for determining the depth of submerged lances and the like. 3,780,581, Cl. 73-302.000.

Action, Floyd; Cochran, Paul E.; and Moore, William G., to Kinnear Corporation. Electronic interlock for door operator. 3,781,622, Cl. 318-466.000.

Adachi, Kazutaka: *See—*
Nishijima, Yoshiaki; and Adachi, Kazutaka, 3,781,174.

Adams, Clark F.: *See—*
Dorsman, Adrian K.; and Adams, Clark F., 3,781,532.

Adams Company, The: *See—*
Hoffmann, Thomas C., 3,780,790.

Adler, Charles F., Jr.; and Silver, Marshall L. Alarm lock. 3,781,861, Cl. 340-280.000.

Adler, Robin: *See—*
Marshall, Howard D.; Gordon, Gary B.; Pipkin, Jesse E.; and Adler, Robin, 3,781,689.

Adwest Engineering Limited: *See—*
Millard, Barry John, 3,780,412.

Aebi, Hans: *See—*
Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,781,356.
Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,781,357.

AFA Corporation of Florida, The: *See—*
Powers, Richard T., 3,780,951.

Aftergot, Siegfried, to General Electric Company. Liquid crystal device for generating reticles in optical equipment. 3,781,080, Cl. 350-10.000.

Agence Nationale de Valorisation de la Recherche (Anvar): *See—*
Juillet, Francois; Teichner, Stanislas; and Formenti, Marc, 3,781,194.

Aglietti, Giancarlo: *See—*
Ferlazzo, Natale; Antonelli, Giambattista; and Aglietti, Giancarlo, 3,781,224.

Agridustrial Electronics, Inc.: *See—*
Resh, Roy E., 3,781,673.

Ahamed, Syed Vickar, to Bell Telephone Laboratories, Incorporated. Data rate-changing and reordering circuits. 3,781,822, Cl. 340-172.500.

Ahearn, Thomas P.; Capowski, Robert S.; Christensen, Neal T.; Gannon, Patrick M.; Lee, Arlin E.; and Liptay, John S., to International Business Machines Corporation. Virtual memory system. 3,781,808, Cl. 340-172.00s.

Ahonen, George Harvey, to Combustion Engineering, Inc. No-weld refractory covering for water cooled pipes. 3,781,167, Cl. 432-234.000.

Aicheles Associates, Inc.: *See—*
Marshall, John J., 3,780,832.

Aikawa, Satoru: *See—*
Okuda, Minoru; Aikawa, Satoru; Kaidzu, Hiromu; and Tajima, Eiichi, 3,781,396.

Aillet, Claude, to Societe Lannionnaise d'Electronique. Pulse-response measuring apparatus. 3,781,668, Cl. 324-57.00r.

Air Industrie, mesne: *See—*
Muhlrad, Wolf, 3,780,497.

Air Preheater Company, Inc., The: *See—*
Hazzard, Noel D.; and Anderson, William M., 3,780,676.

Air Preheater Company, The: *See—*
Liu, Han, 3,780,674.

Airco, Inc., mesne: *See—*
Lofredo, Antony; and Biava, Domenick R., 3,780,534.

Airfix Industries, Limited: *See—*
Turner, Leslie Ashton Steele, 3,780,559.

Aizawa, Tatsuo: *See—*
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 3,781,208.

Aizawa, Tetsuya; Sawada, Taketoyo; Tauchi, Yoshihiko; Kawamata, Tsutomu; and Saya, Hiroshi, to Nippon Telephone & Telephone Public Corporation and Fujitsu Limited. Terminal communication control system and method. 3,781,856, Cl. 340-172.500.

Ajero, Fortunato S. Liquid proportional measuring device. 3,780,582, Cl. 73-320.000.

Ajrulaht, Mamut. Chime battery clock with adjusting wheel for adjusting the movement thereof. 3,780,517, Cl. 58-7.000.

Akatsu, Mitsuhiro: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Akatsu, Mitsuhiro; Maruyama, Isamo; and Izumi, Takahiro, 3,781,299.

Akers, Ronald R.: *See—*
Wolf, Charles B.; and Akers, Ronald R., 3,781,449.

Akin, Cavit, to Standard Oil Company. Process for texturizing microbial cells by alkali-acid treatment. 3,781,264, Cl. 260-112.00r.

Aktiebolaget Astra Sodertalje: *See—*
Carlsson, Lars Anders Fritz; Helgstrand, John Erik; Sjoberg, Berndt Olof Harald; and Stjernstrom, Nils Erik, 3,781,280.

Aktieselskabet Niro Atomizer: *See—*
Hansen, Ove Emil, 3,780,445.

Alagy, Jacob; and Busson, Christian, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for manufacturing terephthalic acid by oxidation of paraxylene. 3,781,344, Cl. 260-524.00r.

Alarm Device Manufacturing Company: *See—*
Guthart, Leo A., 3,781,767.

Alderson, John M. Compressed air spear projecting device. 3,780,720, Cl. 124-11.00a.

Alexander, Arthur Duane, to International Business Machines Corporation. Digital display device. 3,781,851, Cl. 340-324.00m.

Allan, Robert William; Haigh, Curzon John; and Hamdorf, John, to Electrolytic Zinc Company of Australasia, Limited. Method of removing dissolved ferric iron from iron-bearing solutions. 3,781,405, Cl. 423-142.000.

Allegheny Ludlum Industries, Inc.: *See—*
Acre, Thomas R.; Gimbel, Frederick M.; and Ramacheandran, Sundaresan, 3,780,581.

Allen, Edward James, to Dickinson, W. H., Engineering Limited. Feeding of tobacco and other materials. 3,780,886, Cl. 214-17.0ca.

Allen, Joseph C.: *See—*
Christopher, Charles A.; Allen, Joseph C.; and Kolaian, Jack H., 3,780,808.

Allen, Robert A.; and Bement, Elmore L., to United States of America, Air Force, mesne. Signaling device. 3,780,655, Cl. 102-31.000.

Allen-Bradley Company: *See—*
Reichert, Gilbert A.; and Moehrle, Earl R., 3,781,499.

Allied Chemical Corporation: *See—*
Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H., 3,781,370.
Marshall, Robert Moore; and Dardoufas, Kimon Constantine 3,781,202.
Stephenson, Robert L.; and Loomba, Yogendra S., 3,781,497.

Allis, Louis, Company, The: *See—*
Rettig, Charles E., 3,781,641.

Allis-Chalmers Corporation: *See—*
Matthews, Ralph W.; and Schott, Robert E., 3,780,762.

Allison, Rudolph L.; and Lindstrand, Gary L., to MTL Incorporated. Method for sealing balloons and the like. 3,780,419, Cl. 29-451.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Nilsson, Jan, 3,780,554.

Almasi, George S.; Hendel, Robert J.; and Keefe, George E., to International Business Machines Corporation. Magnetoresistive sensing of magnetic bubble domains using expansion. 3,781,832, Cl. 340-174.0eb.

Alsco Anaconda, Inc., mesne: *See—*
Kort, Walter A.; and Brand, Eugene L., 3,780,473.

Aluminum Company of America: *See—*
Hurst, Alvin L., 3,780,418.
Kondis, Thomas J.; and Rolles, Rolf, 3,781,177.

Alvino, William M.; and Koryak, William R., to Westinghouse Electric Corporation. Use of a polysiloxane to eliminate surface flaws in imide and amide-imide polymer films. 3,781,237, Cl. 260-29.1sb.

Amagi, Yasuo: *See—*
Nakao, Masaaki; Shiiki, Zenya; and Amagi, Yasuo, 3,781,170.

AMBAC Industries, Incorporated: *See—*
Taylor, Marvin, 3,780,444.

Ambrose, William J.; and McErlane, James E., to Du Pont de Nemours, E. I., and Company. Apparatus and method for fluid handling and sampling. 3,780,984, Cl. 251-282.000.

American Can Company: *See—*
Holc, Henry Sylvester; and Pillnik, Burton Frank, 3,780,902.

American Cyanamid Company: *See—*
Bollyky, Laszlo Joseph, 3,781,329.
Lutz, Albert William, 3,781,324.
Partridge, Ruth; and Weiss, Martin Joseph, 3,781,429.
Ramsey, Wallace Burton; and De Lapp, Darwin Fiske, 3,781,349.
Shimoda, Keitaro; Kuratani, Keijiro; and Sugiura, Akira, 3,781,391.
Stearns, Edwin Ira, 3,781,909.

American Express Investment Management Corporation: *See—*
Rice, Philip J., Jr., 3,781,474.

American Home Products Corporation: *See—*
Wolf, Milton; Sellstedt, John H.; and Rosen, Harry, 3,781,300.

American Linen Supply Co.: *See—*
Rosenfeld, Howard; and Wetzler, Justin J., 3,780,543.

American Metal Climax, Inc.: *See—*
Biebuyck, Lawrence F., 3,780,472.

American Newspaper Publishers Association: *See—*
Hart, Charles H.; and Cashaw, George R., 3,781,006.

American Optical Corporation: *See—*
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American Totalisator Company, Inc.: *See—*
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American Velcro, Inc.: *See—*
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Amerola Products Corporation, mesne: *See—*
Merola, Anthony, 3,780,923.

Ames, Ward A., to Tridan Tool & Machine, Inc. Feed device for forming apparatus. 3,780,561, Cl. 72-417.000.

Amestoy, Lavern John: *See—*
Hicks, Tommie Earl; and Amestoy, Lavern John, 3,780,871.

Amir, Yoel: *See—*
Kamil, Zvi; Amir, Yoel; and Talmon, Omri, 3,781,498.

AMP Domestic, Inc.: *See—*
Feeser, William Coover; Bosland, Cornelius William; Lockard, Joseph Larue; and Mummey, Dale Brice, 3,781,763.

AMP Incorporated: *See—*
Harwood, Robert George, 3,781,723.
Lynch, James Edward, 3,780,433.
Reynolds, Charles Edward, 3,780,417.
Teagno, Vladimiro; and Campari, Luigi, 3,781,766.

Ampex Corporation: *See—*
Bousky, Samuel, 3,781,464.

Anastasov, Ivan Krestev, to Glavna Directzia KBUMDP pri SGNS. Mechanical coded trick lock. 3,780,548, Cl. 70-352.000.

Ancellin, Marcel, to Societa FFSA. Fibrous substance compression apparatus. 3,780,646, Cl. 100-155.000.

Anchor Hocking Corporation: *See—*
Dickenson, Richard W., 3,780,831.

Ancona, Cesar; and Choquer, Jean, to Centre National d'Etudes Spatiales (CNES). Balloon carried directional antenna. 3,781,894, Cl. 343-706.000.

Anderegg, Max, to Turlabor AG. Process for optical recognition of characters. 3,781,801, Cl. 340-146.3ma.

Anderson, Dale R.: *See—*
Grubbs, Conway E.; and Anderson, Dale R., 3,781,512.

Anderson, Donald L.: *See—*
Harrison, William L.; Purington, Ronald G.; and Anderson, Donald L., 3,781,843.

Anderson Electric Corporation: *See—*
Peek, Vernon E., 3,781,459.

Anderson, Elvin L.; and Graboyes, Harold. Intermediates for preparing acridines. 3,781,358, Cl. 260-566.00b.

Anderson, Harvey B. Firing mechanism for percussion lock firearms. 3,780,464, Cl. 42-69.00r.

Anderson, John Robert, to Hawker Siddeley Dynamics Limited. Viewing system using a multiple array of different-sized detectors. 3,781,558, Cl. 250-332.000.

Anderson, Karl R., to Thompson, John T. and Gillimot, George W. Gang connector and patching cable assembly and method of using same. 3,781,758, Cl. 339-29.000.

Anderson, Lowell W.; and Stephenson, Michael J., to United States of America, Atomic Energy Commission. Production of sintered porous metal fluoride pellets. 3,781,392, Cl. 264-65.000.

Anderson, Thomas E.; and Walden, John P., to General Electric Company. Power supply including inverter having multiple-winding transformer and control transistor for controlling main switching transistors and providing overcurrent protection. 3,781,638, Cl 321-14.000.

Anderson, Thomas W.; and Caroon, Robert L., to Jac, Inc. Ambient compensated temperature responsive device. 3,781,837, Cl. 340-233.000.

Anderson, William M.: *See—*
Hazzard, Noel D.; and Anderson, William M., 3,780,676.

Andrejewski, Bernard R.: *See—*
Larsen, Eric R.; Andrejewski, Bernard R.; and Edamura, Fred Y., 3,781,369.

Andrew Corporation: *See—*
Johnson, Ernest H., 3,780,556.

Andrews, Barry Stewart; Fitzgerald, Desmond Elwyn; and Lewis, Ian Edward, to Conzinc Riotinto of Australia, Limited. Feeding ores or concentrates to smelting furnaces. 3,781,001, Cl. 266-41.000.

Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H., to Allied Chemical Corporation. Novel fluorinated alochols. 3,781,370, Cl. 260-615.00f.

Angel, Henry R., to General Science Corp. Self priming conductivity cell. 3,781,675, Cl. 324-71.0cp.

Angsten, Robert J., to General Motors Corporation. Rotary combustion engine. 3,780,708, Cl. 123-8.170.

Antonelli, Giambattista: *See—*
Ferlazzo, Natale; Antonelli, Giambattista; and Aglietti, Giancarlo, 3,781,224.

Aoki, Katsuo; Yatani, Kozo; Kometani, Eishi; and Izuhara, Seiji, to Takeda Chemical Industries, Ltd. Method for preventing coloring of vitamin C. 3,781,423, Cl. 424-175.000.

APL Corporation: *See—*
Fishman, Aaron Harry; and Parmett, George, 3,780,536.

Appel, Robert L.: *See—*
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Argus Chemical Corporation mesne: *See—*
Smith, Kenneth Burton; and Gladstone, Shaul, 3,780,566.

Arias, Lionel J. De Paula: *See—*
Long, William P.; Sawyer, Walter M.; and Arias, Lionel J. De Paula, 3,780,584.

Arkhangelsky, Georgy Alexandrovich: *See—*
Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Dudko, Daniil Andreevich; Arkhangelsky, Georgy Alexandrovich; Pogoretsky, Georgy Ivanovich; Volgin, Leonid Alexandrovich; Kotov, Viktor Anatolievich; Surnin, Boris Anatolievich; and Degtyarev, Mikhal Vasiievich, 3,780,927.

Arn. Kiekert Sohne: *See—*
Watermann, Hans-Dieter, 3,781,045.

Arnold, Anthony Francis, to RCA Corporation. Multilayer heat sink. 3,780,795, Cl. 165-80.000.

Aronoff, Leonard S. Illuminated displays and illuminaries. 3,780,463, Cl. 40-130.00k.

Aronovich, Khaim-Mordkhe: *See—*
Shilov, Alexandr E.; Dyachkovsky, Fridrikh S.; Chirkov, Nikolai Mikhailovich; Matkovsky, Petr E.; Aronovich, Khaim-Mordkhe; Beikhold, Alina A.; and Russian, Ljudmila, 3,781,220.

Arretz, Emmanuel: *See—*
Pfister, Alain; Arretz, Emmanuel; and Donche, Alain, 3,781,366.

Arrington, Thomas L.; and Dyer, Norman D., to Dresser Industries, Inc. Earth boring machine with tandem thrust cylinders. 3,780,816, Cl. 173-152.000.

Arrow-Hart, Inc.: *See—*
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Artzer, Charles W.: *See—*
Doyle, William F.; and Artzer, Charles W., 3,780,673.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Chono, Masazumi; Nakajima, Hitoshi; Taguchi, Masayoshi; and Matsuo, Noriaki, 3,781,336.
Kobayashi, Hidehiko; Sasaguri, Kiichiro; and Shiga, Masaaki, 3,781,399.
Kominami, Naoya; Iwaisako, Toshiyuki; and Ohki, Kusuo, 3,781,221.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Mori, Chiharu, 3,781,119.
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Nakajima, Tohru, 3,780,630.

Asahi-Dow Limited: *See—*
Izawa, Shinichi; Toyama, Kunio; Harada, Kazuhiko; and Sugawara, Yoshiaki, 3,781,382.

Asai, Osamu: *See—*
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Ashida, Sakichi: *See—*
Kumada, Akio; Onishi, Yoshihiro; Ogawa, Horohumi; Ashida, Sakichi; and Nonogaki, Saburo, 3,781,086.

Ashton, John Congreve, to Baker, Benjamin, (Lye) Limited. Horseshoes. 3,780,810, Cl. 168-4.000.

Aspinwall, Robert H., to General Motors Corporation. Cooled airfoil. 3,781,129, Cl. 416-97.000.

Athey, Roy L., to United Aircraft Corporation. Forging die lubrication. 3,780,553, Cl. 72-41.000.

Atkins, Ronald T.: *See—*
Sellman, Paul V.; Dingman, S. Lawrence; and Atkins, Ronald T., 3,780,578.

Atlantic Richfield Company: *See—*
Friedman, Bernard S.; and Nason, Steven B., 3,781,342.
Johnson, Marvin F. L.; and Graff, Stuart L., 3,781,219.
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Knowles, Charles R.; and Ruckel, Douglas J., 3,781,456.
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Perkins, Thomas K., 3,780,750.
Styring, Ralph E., Jr., 3,780,751.

Atlas Copco Aktiebolag: *See—*
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Auerbach, Hayward B.: *See—*
Fitzpatrick, William E.; Berger, Leonard; and Auerbach, Hayward B., 3,780,908.

Automatic Bar Feed Ltd.: *See—*
Eichenhofer, Josef, 3,780,924.

Automation Industries, Inc.: *See—*
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Automobiles Peugeot: *See—*
Quesnel, Marcel; and Guerin, Jean, 3,781,044.
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Avco Corporation, mesne: *See—*
Maryatt, Michael B.; and McCoy, James M., 3,781,486.
Swain, William W.; and Hathaway, Richard A., 3,781,487.

Avis, John M., to Koehring Company, mesne. Trash separator for crop pick-up harvester. 3,780,511, Cl. 56-364.000.

Ayers, David L.: *See—*
Blewitt, Donald D.; and Ayers, David L., 3,781,747.

Ayers, Robert C., Jr.; Bayless, Jack H.; Graham, John W.; Lloyd, James R.; Loth, William D.; and Williams, Robert E., to Esso Production Research Company. Method and apparatus for controlling wells. 3,780,809, Cl. 166-314.000.

Azbell, James W.: *See—*
Fretwell, Richard D.; Azbell, James W.; and Mason, Edwin E., 3,781,817.

Baas, Gerardus; and Bloemenoal, Frans Victor Willem Ten, to U.S. Philips Corporation. Method of establishing relatively insulated connections between conductor ends and an insulating substrate. 3,780,432, Cl. 29-625.000.

Babbitt, Richard W.; and LoCicero, Joseph, to United States of America, Army. Substrate holder for arc plasma deposition. 3,780,696, Cl. 118-49.500.

Babcock & Wilcox Company, The: *See—*
Pacault, Pierre Henri; and Kagans, Marc, 3,780,786.
Rudd, Alexander H.; Kidwell, John H.; and Murray, Thomas J., 3,781,162.

Bachel, Francis D.; and Voves, Robert A., to E-Z Tow, Inc. Tow bar for towing disabled snowmobiles. 3,781,038, Cl. 280-493.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Beutel, Peter; and Koenig, Karl-Heinz, 3,781,389.
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Gulbins, Erich; Hauss, Alfred; Kieferle, Friedrich; and Kovacs, Jenoe, 3,781,243.
Himmele, Walter; Fliege, Werner; and Forehlich, Helmut, 3,781,337.
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Baes, Charles F., Jr.; Bamberger, Carlos E.; and Ross, Robert G., to United States of America, Atomic Energy Commission. Recovery of protactinium from molten fluoride nuclear fuel compositions. 3,781,403, Cl. 423-5.000.

Bagley, John M.; and Keays, John L., to Ellett Copper and Brass Company Ltd. Experimental research pulp digester assembly. 3,781,188, Cl. 162-233.000.

Bail, John W., to Narco Scientific Industries, Inc. Digital distance ranging system. 3,781,888, Cl. 343-13.00r.

Baird, Albert W., III: *See—*
Lustig, Claude D.; and Baird, Albert W., III, 3,781,587.

Baker, Benjamin, (Lye) Limited: *See—*
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Baker, Cole H., to Intec Corporation. Flaw detector system utilizing a laser scanner. 3,781,531, Cl. 235-151.300.

Baker, Don R.: *See—*
Mihailoviski, Alexander; and Baker, Don R., 3,781,326.

Baker, Don R.; and Teach, Eugene G., to Stauffer Chemical Company. Bromoacetanilides useful as biocides. 3,781,442, Cl. 424-324.000.

Baker, Donald E.: *See—*
Shuey, Kenneth C.; and Baker, Donald E., 3,781,572.

Baker, Elizabeth, F.: *See—*
Baker, Richard E.; and Baker, Elizabeth, F., 3,781,007.

Baker, Leroy D., to Diamond International Corporation. Package capping apparatus. 3,780,493, Cl. 53-287.000.

Baker, Richard E.; and Baker, Elizabeth, F. Sectional, folding, combination dumbell-bar bell. 3,781,007, Cl. 272-84.000.

Baker, Thoedore H.; Ghafghaichi, Majid; and Totta, Paul A., to International Business Machines Corporation. Semiconductor integrated circuit chip structure protected against impact damage from other chips during chip handling. 3,781,609, Cl. 317-101.00a.

Balch, Alfred H., to Marathon Oil Company. Color sonagrams and method for their production. 3,781,785, Cl. 340-15.5ds.

Balducci, Agostino: *See—*
Corbellini, Margherita; and Balducci, Agostino, 3,781,318.

Baldwin, Douglas S.; Benton, Kenneth E.; and Jacques, Vincent L., to International Business Machines Corporation. Cassette player. 3,781,017, Cl. 274-4.00c.

Baldwin, Mart G.; and Reed, Samuel F., Jr., to Rohm & Haas Company. Propellant composition with a hydroxy-terminated copolymer-binder-catalyst of butadiene and acrylate. 3,781,178, Cl. 149-19.900.

Bali, Joseph. Ticket accepting machines in particular for public transit system. 3,780,844, Cl. 194-4.000.

Ball Corporation: *See—*
Lind, Archie L.; and Cobb, Mack R., 3,780,551.

Ballman, Gray C. Means and methods for ferro-resonant float charging circuits. 3,781,630, Cl. 320-21.000.

Balthazar, Real J.; and Halberg, Richard A., to Sargent Industries, Inc. Method of making a pipe with refined grain structure. 3,780,555, Cl. 72-69.000.

Balwe, Thomas; and Sabel, Johann, to Wacker-Chemie G.m.b.H. Process for the suspension polymerization of vinyl chloride. 3,781,255, Cl. 260-87.100.

Bamberger, Carlos E.: *See—*
Baes, Charles F., Jr.; Bamberger, Carlos E.; and Ross, Robert G., 3,781,403.

Bando Chemical Industries, Ltd.: *See—*
Takamatsu, Hideaki; Murashima, Noboru; and Nishihira, Koichi, 3,781,185.

Bandukwalla, Phiroze, to General Motors Corporation. Centrifugal compressor diffuser. 3,781,128, Cl. 415-211.000.

Banford, John Alexander, to Abbott Laboratories. Method of treating bovine mastitis by means of an erythromycin solution. 3,780,737, Cl. 128-260.000.

Baran, Henri: *See—*
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Bard, C. R., Inc.: *See—*
Rosano, Joseph G., Jr.; and Vaillancourt, Vincent L., 3,780,857.

Barito, Robert W.: *See—*
Smith, William E.; Orlando, Charles M.; and Barito, Robert W., 3,781,229.

Barlow, Gordon A., to Glass, Marvin, & Associates. Game wit race figure movement determined by projectile progerting skill. 3,781,011, Cl. 273-86.00g.

Barnard, Mark Cary Sedgwick; and Butler, Lawrence. Thermal regenerators. 3,780,791, Cl. 165-9.000.

Barnard, Ronald K., to National Distillers and Chemical Corporation. Digital integrating flowmeter. 3,780,579, Cl. 73-229.00r.

Barnes, Emmett W., to General Electric Company. Grounding clip for plug-in surface heating unit. 3,781,757, Cl. 339-14.001.

Baron, Stanley N.; and Kreinik, Stephen, to Columbia Broadcasting System, Inc. Method and apparatus for generating self contrasting character images. 3,781,849, Cl. 340-324.0ad.

Barron, Charles Dwain; Geczy, Bela; and Wilms, Carl Alfred, to Jackson, Bryon, Inc. Power tong positioning apparatus. 3,780,815, Cl. 173-43.000.

Barry, James D.; and Boney, William E., to United States of America, Air Force. Carbon monoxide laser by acetylene oxidation. 3,781,713, Cl. 331-94.500.

Barten, Piet Gerard Joseph; and Ferguson, Eric Tapley, to U.S. Philips Corporation. Exposure device for manufacturing a display screen of a colour television display tube. 3,780,629, Cl. 95-1.00r.

Bartman, Robert V.: *See—*
Harnstone, Leonard A.; Levy, Robert E.; Morris, Stanley M.; Lopez, Alfredo M.; Mosler, Henry A.; and Bartman, Robert V., 3,781,533.

Bartoszevicz, Joseph G.; Murphy, George H., Jr.; and Schmidt, Frederick W., to Fansteel Inc. Threading tool. 3,780,409, Cl. 29-97.000.

Bass, Merlyn Duane: *See—*
Pettengill, Donald Herbert; and Bass, Merlyn Duane, 3,780,505.

Bassham, Kenneth John; and Feast, Alan Arthur John, to International Synthetic Rubber Company. Method of treating a polymer latex. 3,781,236, Cl. 260-23.70m.

Batchelor, Anthony C.: *See—*
Cragg, William D.; Bradshaw, Leslie E. B.; Batchelor, Anthony C.; and Carter, Ronald D., 3,781,492.

Bates, Kenneth Clayton. Rotary apparatus having two rotors engaging rotary dividers in a housings. 3,781,146, Cl. 418-6.000.

Batsch, Helmut; Jahnel, Benno; Weinz, Ernst August; Berger, Wolfgang; and Dickopp, Gerhard, to Licentia Patent-Verwaltungs-G.m.b.H. Diamond stylus for disc records. 3,781,020, Cl. 274-38.000.

Bauer, Evgeny Teodorovich: *See—*
Dolgov, Anatoly Vladimirovich; Konovalov, Leonid Vladimirovich; Perkis, Leib Benyaminovich; Deev, Stanislav Lvovich; Dyakov, Vitaly Evgenievich; Semenov, Alexandr Efimovich; Bauer, Evgeny Teodorovich; and Suturin, Serafim Nikolaevich, 3,780,864.

Bauman, Weldon W.; and Collins, Edward, IV, to Itek Corporation. Pulse repetition frequency filter circuit. 3,781,691, Cl. 328-109.000.

Bay, Eduard. Casserole. 3,780,642, Cl. 99-347.000.

Bayer Aktiengesellschaft: *See—*
Feltgen, Karl-Heinz; and Espanion, Gunther, 3,781,393.
Kishino, Shigeo; Yamada, Yasuo; Kurahashi, Yoshio; and Kume, Toyohiko, 3,781,386.
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Muller, Erwin; Wirth, Wolf-Dieter; Blahak, Johannes; and Rohr, Harry, 3,781,233.
Pampus, Gottfried; Schon, Nikolaus; Witte, Josef; and Marwede, Gunter, 3,781,257.
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Beach-Buoy, Inc.: *See—*
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Beamon, Howard L.: *See*—
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Beasley, Hazel A.: *See*—
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Beatrice Foods Co., mesne: *See*—
Linder, Henry, 3,781,082.

Beausoleil, William Francis, to International Business Machines Corporation. Monolithic memory utilizing defective storage cells. 3,781,826, Cl. 340-173.00r.

Bebbington, Alan: *See*—
Ford-Moore, Arthur Henry; and Bebbington, Alan, 3,781,387.

Beche & Grohs GmbH: *See*—
Zimmer, Kurt; and Schneider, Wilhelm, 3,780,560.

Bechtold, Edwin W., to Itek Corporation. Aspheric lens surface. 3,781,097, Cl. 351-167.000.

Beckman, Jesse Wasson Wilson. Sawmill. 3,780,611, Cl. 83-751.000.

Behrenz, Wolfgang: *See*—
Kuhle, Engelbert; Klauke, Erich; Behrenz, Wolfgang; and Frohberger, Paul Ernst, 3,781,331.

Beighbour, Frank: *See*—
Penn, Alan William; and Beighbour, Frank, 3,781,176.

Beikhold, Alina A.: *See*—
Shilov, Alexandr E.; Dyachkovsky, Fridrikh S.; Chirkov, Nikolai Mikhailovich; Matkovsky, Petr E.; Aronovich, Khaim-Mordkhe; Beikhold, Alina A.; and Russian, Ljudmila, 3,781,220.

Bell & Howell Company: *See*—
Byers, Robert A., 3,781,488.
Jeffers, Frederick J.; and Rolker, John H., 3,781,903.

Bell Telephone Laboratories, Incorporated: *See*—
Ahamed, Syed Vickar, 3,781,822.
Blahut, Donald Edgar; and Froehlich, Fritz Edgar, 3,781,478.
Ching, Yau Chau, 3,781,685.
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Deisch, Cecil Winston, 3,781,483.
Downing, Randall William, 3,781,810.
Geusic, Joseph Edward, 3,781,833.
Mueller, Kurt Hugo, 3,781,720.
Senese, Daniel John, 3,781,823.
Smith, Nicholas Kimbrough, 3,781,796.
Sullivan, Daniel David, 3,781,791.

Bellmer, Frederich Otto, to Fedders Corporation. Seal sleeve for oil separator. 3,781,138, Cl. 417-368.000.

Beloit Corporation: *See*—
Melead, James J.; and Wentworth, William P., 3,780,697.

Belov, Vladimir Alexandrovich: *See*—
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich, 3,780,428.

Bement, Elmore L.: *See*—
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Bendix Corporation, The: *See*—
Gardner, Delbert J., 3,780,620.
Rosenbaum, Erik; and Martin, John Waldo, 3,781,569.
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Tuss, John J., 3,780,595.

Bendix Westinghouse, Limited: *See*—
Merrilees, James Drummond, 3,780,592.

Benisek, Edward F., to Wallace-Murry Corporation. Turbocharger compressor with dual inlet and collector chambers. 3,781,126, Cl. 415-143.000.

Bennett, Lowell L.: *See*—
Lohr, Raymond J.; Smith, James; and Bennett, Lowell L., 3,780,665.

Bennett, Moreland P., to General Electric Company. Fusion braid weld. 3,781,513, Cl. 219-137.000.

Benschop, Gerardus Cornelis Marie: *See*—
Friebel, Hendrikus Johannes Christianos; Jonker, Simon; and Benschop, Gerardus Cornelis Marie, 3,780,429.

Benson, Jack M.: *See*—
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Benton, Kenneth E.: *See*—
Baldwin, Douglas S.; Benton, Kenneth E.; and Jacques, Vincent L., 3,781,017.

Benton, Kenneth E.; and Jacques, Vincent L., to International Business Machines Corporation. Cassette player. 3,781,016, Cl. 274-4.00c.

Benwilco Inc.: *See*—
Williams, Benjamin F., 3,780,709.

Berger, Leonard: *See*—
Fitzpatrick, William E.; Berger, Leonard; and Auerbach, Hayward B., 3,780,908.

Berger, Wolfgang: *See*—
Batsch, Helmut; Jahnel, Benno; Weinz, Ernst August; Berger, Wolfgang; and Dickopp, Gerhard, 3,781,020.

Beriger, Ernst; and Pinter, Ladislaus, to Ciba-Geigy AG. Phosphoric acid esters and pesticidal preparations containing them. 3,781,426, Cl. 424-212.000.

Beriger, Ernst, to Ciba-Geigy AG. Phosphoric acid esters, and their use as insecticides. 3,781,427, Cl. 424-217.000.

Berkoff, Charles E.; Sutton, Blaine M.; and Walz, Donald T., to Smithkline Corporation. Methods of producing anit-arthritic activity using 3-substituted phenyl-2-thio-1,3-thiazane-2,4-dione. 3,781,434, Cl. 424-246.000.

Berkovskaya, Karina Fridrikhovna; Lapteva, Nina Vitalievna; and Podlaskin, Boris Georgievich. Apparatus for analyzing an image. 3,781,553, Cl. 250-553.000.

Bernard, Albert: *See*—
Tagarie, Frederic Louis Joseph; Bernard, Albert; and Saint-Aubin, Georges Gilbert, 3,780,617.

Bernatowicz, Daniel T.: *See*—
Forestieri, Americo F.; Broder, Jacob D.; and Bernatowicz, Daniel T., 3,780,424.

Berner, Ole, to Dameca A/S. Valve, preferably for anaesthetic plants of the closed type. 3,780,760, Cl. 137-516.250.

Berns, Charles, to Edwards Company, Inc. Stable multivibrator D.C. bell. 3,781,877, Cl. 340-396.000.

Bernstein, Sidney: *See*—
Wood, Harrison F.; and Bernstein, Sidney, 3,781,192.

Bertran & Hargraves, Inc.: *See*—
Hargraves, William J., 3,780,997.

Bertus, Brent J.: *See*—
Walker, Darrell W.; Farha, Floyd E., Jr.; and Bertus, Brent J., 3,781,223.

Bespak Industries Limited: *See*—
Warren, William Edward, 3,780,913.

Beta Engineering & Development Ltd.: *See*—
Kamil, Zvi; Amir, Yoel; and Talmon, Omri, 3,781,498.

Bethlehem Steel Corporation: *See*—
Sundy, George J., 3,780,788.

Bettin, Hubertus: *See*—
Firnig, Fritz; Bettin, Hubertus; and Lorenzen, Gunter, 3,781,904.

Beukers, John M.; and Poppe, Martin. Antenna for weather balloon. 3,781,893, Cl. 343-702.000.

Beukers Laboratories, Inc.: *See*—
Poppe, Martin C., Jr.; and Friedman, Maurice, 3,781,715.

Beutel, Peter; and Koenig, Karl-Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the production of substituted thionophosphoryl chlorides. 3,781,389, Cl. 260-986.000.

Biava, Domenick R.: *See*—
Lofredo, Antony; and Biava, Domenick R., 3,780,534.

Bichel, Darwin Carl; and Malcolm, Robert La Verne, to Deere & Company. Crop feeding conveyor for a harvester. 3,780,851, Cl. 198-175.000.

Biebuyck, Lawrence F., to American Metal Climax, Inc. Door structure. 3,780,472, Cl. 49-501.000.

Billarani, Patrick; Goubeau, Robert; and Langlois, Jacques, to Velcro France. Partitions covered with a facing a fabric. 3,780,479, Cl. 52-222.000.

Billingsly, Lloyd E.: *See*—
White, William E., Jr.; and Billingsly, Lloyd E., 3,780,421.

Binnig, Horst; Freyen, Jurgen; and Middleman, Dirk-Friedrich. Digital multiplex control servo. 3,781,627, Cl. 318-562.000.

Biondi, Emanuele; and Biondi, Leonardo. Method and apparatus for making the human voice audible and comprehensible to severely deaf persons. 3,781,491, Cl. 179-107.00r.

Biondi, Leonardo: *See*—
Biondi, Emanuele; and Biondi, Leonardo, 3,781,491.

Birchall, James Derek; Cassidy, John Edward; and Smith, Frank, to Imperial Chemical Industries, Limited. Fluorocarbon polymer composition containing an adhesion promoter. 3,781,239, Cl. 260-30.60r.

Birkin, Michael S., to British Railways Board. Error detection in communication system by repetition of data. 3,781,792, Cl. 340-146.1ba.

Bishop, Stephen G.; and Moore, William J., to United States of America, Navy. Chalcogenide glass bolometer. 3,781,748, Cl. 338-15.000.

Black and Decker Manufacturing Company, The: *See*—
Rosenthal, Francis Joseph, Jr.; and Rohr, Lewis Hampton, 3,781,579.

Black, James A.; and Farwell, Harry Russell. Screen printer ink supply with quick coupling and level sensing. 3,780,651, Cl. 101-115.000.

Black, James A.; and Farwell, Harry Russell. Screen printer with screen infeed means. 3,780,652, Cl. 101-124.000.

Blackburn, Richard D., to General Electric Company. D.C. motor braking circuit especially for use with voltage regulators. 3,781,621, Cl. 318-373.000.

Blackburn, Tom L.: *See*—
Wisotzky, Otto G.; Blackburn, Tom L.; and Urbach, Roy J. G., 3,781,482.

Blackstone, Robert Clifford, to Du Pont de Nemours, E. I., and Company. Removal of 1,2-diaminocyclohexane impurity from crude hexamethylenediamine. 3,781,362, Cl. 260-583.00n.

Blackwell, Sam M., to McFarlan, A. I., Company Incorporated. Air conditioning system and method. 3,780,941, Cl. 236-49.000.

Blaha, Franklyn C.: *See*—
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., 3,781,574.

Blahak, Johannes: *See*—
Muller, Erwin; Wirth, Wolf-Dieter; Blahak, Johannes; and Rohr, Harry, 3,781,233.

Blahut, Donald Edgar; and Froehlich, Fritz Edgar, to Bell Telephone Laboratories, Incorporated. Multiplex communication system. 3,781,478, Cl. 179-15.0al.

Blair Engineering, Inc.: *See*—
Blair, William G., 3,780,531.
Blair, William G., to Blair Engineering, Inc. Hydroturbine. 3,780,531, Cl. 60-40.000.
Blake, William L. Coaxial cable connector. 3,781,771, Cl. 339-272.00a.
Blewitt, Donald D.; and Ayers, David L., to Westinghouse Electric Corporation. Current limiting fuse including improved fuse elements. 3,781,747, Cl. 337-295.000.
Bloemendaal, John F.; and Stockdale, Willis L., to Eastman Kodak Company. Cartridge stripper. 3,780,922, Cl. 226-92.000.
Bloemenoal, Frans Victor Willem Ten: *See*—
Baas, Gerardus; and Bloemenoal, Frans Victor Willem Ten, 3,780,432.
Blohm & Voss AG: *See*—
Krakow, Heinz, 3,781,509.
Bloomer, Milton D.: *See*—
Ketchum, Marshall D.; and Bloomer, Milton D., 3,781,506.
Blues, Ernest Thomson: *See*—
Bryce-Smith, Derek; and Blues, Ernest Thomson, 3,781,317.
Boardman Company, The: *See*—
Frye, James A.; Morton, Ralph B.; and Vogler, Charles W., 3,780,675.
Bobkov, Alexandr Vasilievich: *See*—
Odkopaev, Boris Ivanovich; Bobkov, Alexandr Vasilievich; and Chervyakova, Ljudmila Dmitievna, 3,780,450.
Bockwoldt, Walter H., to Hughes Aircraft Company. System for controlling the target voltage of image sensors. 3,781,591, Cl. 315-3.00c.
Boden, Ogden W. Hat or cap constructed for air circulation therethrough. 3,780,382, Cl. 2-182.600.
Bodge, Clifford A., to Texas Instruments, Incorporated. Fluid flow sensing device. 3,781,839, Cl. 340-239.00r.
Bodle, Ronald L.: *See*—
Moore, Leonard; and Bodle, Ronald L., 3,781,724.
Bodway, George E. Thin film circuits and method for manufacture. 3,781,610, Cl. 317-101.00a.
Bodycomb, Alistair Kenyon, to Domtar Limited. Paper plug removal from drilled reams. 3,781,124, Cl. 408-61.000.
Boehland, Robert R., Jr., to Feather Hill Industries, Inc. Bird feeder. 3,780,703, Cl. 119-53.000.
Boehringer Mannheim Gesellschaft mit beschrankter Haftung: *See*—
Kampe, Wolfgang; Fauland, Erich; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 3,781,273.
Witt, Ernst-Christian; Stach, Kurt; Thiel, Max; Schmidt, Felix Helmut; and Stork, Harald, 3,781,328.
Boekhorst, Antonius, to U.S. Philips Corporation. Circuit arrangement for generating a mainly sawtooth deflection current of line frequency in a picture display apparatus. 3,781,603, Cl. 315-276.00d.
Boger, Henry W.: *See*—
Borg, Karl Stanley; and Boger, Henry W., 3,780,767.
Bohemia Lumber Company, Incorporated: *See*—
Trocino, Frank S., 3,781,187.
Bohn, Gerhard: *See*—
Schwarzler, Peter; Bohn, Gerhard; and Schauberger, Helmut, 3,780,668.
Bohn, Manfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Therapeutic solution of iron and liposoluble vitamins. 3,781,422, Cl. 424-147.000.
Bolex International SA: *See*—
Heiniger, Wilfred; and Lepinay, Gerard, 3,781,098.
Kruszynski, Stanislaw, 3,781,618.
Bollag, Werner; Rigassi, Norbert; and Schwieter, Ulrich, to Hoffmann-La Roche Inc. Polyene compounds. 3,781,314, Cl. 260-410.900.
Bollinger, Edward R., Jr.: *See*—
Abarotin, Eugene V.; and Bollinger, Edward R., Jr., 3,781,663.
Bollyky, Laszlo Joseph, to American Cyanamid Company. Electronegatively substituted carboxyphenyl oxalates as superior chemiluminescent materials. 3,781,329, Cl. 260-479.00s.
Boney, William E.: *See*—
Barry, James D.; and Boney, William E., 3,781,713.
Bonn, Theodore H., to Sperry Rand Corporation. Gas discharge display apparatus. 3,781,599, Cl. 315-169.0tv.
Booth, John F.: *See*—
McLeod, John W.; Gray, Laverne E.; and Booth, John F., 3,780,855.
Boots Pure Drug Company Limited: *See*—
Harrison, Ian Robert; McCarthy, John Felix; and Palmer, Bryan Harper, 3,781,355.
Bordowsky, Karl Heinz: *See*—
Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, 3,780,601.
Borg, Karl Stanley; and Boger, Henry W., to Masoneilan International, Inc. Control valve trim having high resistance vortex chamber passages, 3,780,767, Cl. 137-625.300.
Borg-Warner Corporation: *See*—
Norbeck, Dean K.; and Kimpel, Francis A., 3,780,532.
Borghetti, Giuseppe, to Telemeccanica Elettrica Officine Meccaniche Reunite S.p.A. SIngle pole electric switch with contacts convertible from normally open to normally closed and vice versa. 3,781,501, Cl. 200-166.0bc.
Bormann, Dieter; and Worm, Manfred, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for preparing cephem-4-carboxylic acid esters. 3,781,283, Cl. 260-243.00c.
Borom, Marcus P.; and De Vries, Robert C., to General Electric Company. Thermochromic surface heating apparatus. 3,781,522, Cl. 219-462.000.
Borom, Marcus P., to General Electric Company. Thermochromic surface heating apparatus. 3,781,523, Cl. 219-462.000.
Bosland, Cornelius William: *See*—
Feeser, William Coover; Bosland, Cornelius William; Lockard, Joseph Larue; and Mummey, Dale Brice, 3,781,763.
Botnick, Irlin: *See*—
Botnick, Irlin; and Golrick, Philip D. (said Golrick assor to said), 3,781,034.
Botnick, Irlin; and Golrick, Philip D., said Golrick assor to said Botnick, Irlin. Vehicle safety harness rigging. 3,781,034, Cl. 280-150.0sb.
Botsch, Bertram, to Machinenfabrik H. Geiger. Aerating and agitating device. 3,780,998, Cl. 261-91.000.
Bott, Lawrence L., to Nalco Chemical Company. Inverted mixed latex for water flooding. 3,780,806, Cl. 166-275.000.
Bottoms, Garrell C., to Continental Oil Company. Rotary distributor means and method. 3,780,887, Cl. 214-17.0cb.
Boudinet, Guy; and Rocca-Serra, Jean, to Compagnie General d'Electricite. Gas laser generator devices. 3,781,710, Cl. 331-94.500.
Boudreau, Paul E.; Dixon, Roy C.; Donnan, Robert A.; and Moss, Eual A., to International Business Machines Corporation. Terminal interface for a serial loop communications system having store and forward capability. 3,781,815, Cl. 340-172.500.
Bousky, Samuel, to Ampex Corporation. Light scanning apparatus and method for converting display information into storable video data. 3,781,464, Cl. 178-5.400.
Bovee, Boyd L. Ski stopping structure. 3,781,026, Cl. 280-11.13b.
Bowen, James G.: *See*—
Smith, Allan L.; and Bowen, James G., 3,780,946.
Bowmar/Ali, Inc.: *See*—
Feeney, James Henry, 3,780,430.
Feeney, James Henry, 3,780,431.
Bowmor Instrument Corporation: *See*—
White, Edward A.; and Bunting, James H., 3,781,852.
Boyd, James C. Safety retainer for collared chisels in chipping hammers. 3,781,023, Cl. 279-19.600.
Boyden, Robert E., to O'Reilly, Thomas B. Power driven typewriter with single type head. 3,780,845, Cl. 197-18.000.
Boyer, Marcel Louis, to C.I.T.-Compagne Industrielle des Telecommunication. Radio transmitter receiver including level and antenna direction control circuitry. 3,781,890, Cl. 343-100.0cs.
Boyles, Robert L., to General Electric Company. Digital display indicator. 3,780,524, Cl. 58-125.00c.
BP Chemicals International Limited: *See*—
Davis, Paul Trevor; Glover, Terence George; and Jones, John Robert, 3,781,195.
Brac, Charles, Jr.: *See*—
Finestone, Arnold B.; Westphal, Richard C.; and Brac, Charles, Jr., 3,781,383.
Bradshaw, Leslie E. B.: *See*—
Cragg, William D.; Bradshaw, Leslie E. B.; Batchelor, Anthony C.; and Carter, Ronald D., 3,781,492.
Braid, Milton, to Mobil Oil Corporation. Lubricant compositions. 3,781,206, Cl. 252-51.50r.
Brand, Abraham, to General Instrument Corporation. Method and apparatus for aligning magnetic heads in a magnetic disc recorder. 3,781,489, Cl. 179-100.20r.
Brand, Eugene L.: *See*—
Kort, Walter A.; and Brand, Eugene L., 3,780,473.
Brandenburg, Klaus, to U.S. Philips Corporation. Thermodynamic reciprocating machine with controlled fuel/air supply. 3,780,528, Cl. 60-39.270.
Branick Manufacturing Company: *See*—
Castoe, John H., 3,780,988.
Branscome, Kenneth M.: *See*—
Goode, George E.; Morgan, Barrie O.; and Branscome, Kenneth M., 3,781,472.
Goode, George E.; and Branscome, Kenneth M., 3,781,473.
Braun, Dieter, to Fortuna-Werke Maschinenfabrik Aktiengesellschaft. Shoe treatment. 3,780,390, Cl. 12-1.00r.
Braverman, Milton, to Medi-Dise, Inc. Medicinal dispensing device. 3,780,856, Cl. 206-56.0ab.
Brennan, William B. Paint accomodating modules adapted for use with spray guns. 3,780,950, Cl. 239-306.000.
Brenneisen, Paul: *See*—
Spaun, Ruediger; Rochat, Alain Claude; Gallay, Jean-Jacques; and Brenneisen, Paul, 3,781,290.
Bridgestone Liquefied Gas Company, Ltd.: *See*—
Yamamoto, Katsuro, 3,780,900.
Brilando, Frank P., to Schwinn Bicycle Company. Speedometer driver for bicycle quick-release hubs. 3,781,036, Cl. 280-289.000.
Brill, Edward F., to Beach-Buoy, Inc. Float. 3,780,686, Cl. 114-.50f.
Bristol-Myers Company: *See*—
Kawaguchi, Hiroshi; Naito, Takayuki; and Nakagawa, Susumu, 3,781,268.
British Iron and Steel Research Association, The: *See*—
Davis, Norman, 3,781,662.
British Oxygen Company Limited, The: *See*—
Power, Basil Dixon; Oswald, Roger Derek; and Tooth, David Michael, 3,781,518.
British Railways Board: *See*—

Birkin, Michael S., 3,781,792.

Britland, Colin Morris; and Thorpe, John Bernard Joseph, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Navigational apparatus. 3,781,530, Cl. 235-150.260.

Brockman, Lyle, to General Signal Corporation. Highway crossing signal control system for railroads. 3,781,542, Cl. 246-128.000.

Brockmann, Hans-Jurgen, to U.S. Philips Corporation. Field deflection circuit. 3,781,589, Cl. 315-27.0td.

Broder, Jacob D.: *See—*
Forestieri, Americo F.; Broder, Jacob D.; and Bernatowicz, Daniel T., 3,780,424.

Brodersen, John C. Mounting apparatus for gas containers. 3,780,972, Cl. 248-313.000.

Bronson, Orville P.; and Crabtree, Bruce L., Sr. Secondary lip for scrapers. 3,780,456, Cl. 37-125.000.

Brooks, Frank W., to General Motors Corporation. Bushing assembly. 3,781,068, Cl. 308-4.00r.

Brother Kogyo Kabushiki Kaisha: *See—*
Sasaki, Toshio, 3,780,681.

Brown, Alvin E., to Saratoga Systems, Inc. Ultrasonic fluid speed of sound and flow meter apparatus and method. 3,780,577, Cl. 73-194.00a.

Brown, Cicero C. Pipe handling system for use in well drilling. 3,780,883, Cl. 214-2.500.

Brown, Francis Barton; and Budrys, Vitolis, to Kobe, Inc. Well pumping system with parallel jet pumps. 3,781,134, Cl. 417-176.000.

Brown, Gordon P., to Eastman Kodak Company. Strip cutting and mounting apparatus. 3,780,608, Cl. 83-375.000.

Brown, Kenneth Robson, to Ferranti Limited. Information storage apparatus. 3,781,466, Cl. 178-6.800.

Bruce-Sanders, James Frederick. Liquid delivery systems. 3,781,534, Cl. 235-151.340.

Brudy, Peter E.; and Smith, John. Emergency warning lamp. 3,781,538, Cl. 240-49.000.

Bruinshorst, Berend Theodorus Jan; and Van Kessel, Theodorus Jozef, to U.S. Philips Corporation. Filter for use in a carrier-wave measuring system. 3,781,697, Cl. 328-167.000.

Bruker-Physik AG: *See—*
Haas, Joerg Philipp, 3,781,735.

Brunswick Corporation: *See—*
Hungerford, Daniel Comstock, 3,780,688.

Bryce-Smith, Derek; and Blues, Ernest Thomson. Silver ketenide and preparation thereof. 3,781,317, Cl. 260-430.000.

Bryson, Millard C.; McKinney, Joel D.; Titmus, Robert A.; and White, Frederick K., to Gulf Research & Development Company. Process for cracking hydrocarbons containing hydrodesulfurized residual oil. 3,781,197, Cl. 208-120.000.

Bryzinsky, Frank M.: *See—*
Grazen, Frank S.; Buike, Melvin E.; and Bryzinsky, Frank M., 3,781,241.

Buchwald, Robert M. Vehicle height adjusting suspension arrangement. 3,781,033, Cl. 280-124.00r.

Buckman, Wayne T.: *See—*
Miller, Blaine Monroe, Jr.; Buckman, Wayne T.; and Warner, Ellis R., Jr., 3,780,956.

Bucksch, Manfred: *See—*
Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, 3,780,601.

Buddendeck, Gerald A.; Hubler, Lawrence C.; Heiler, Paul S.; and Koch, Gilbert E., to Xerox Corporation. Conveying system for electrostatographic printing machines. 3,781,004, Cl. 271-10.000.

Budmiger, Hermann: *See—*
Hanggi, Peter; and Budmiger, Hermann, 3,781,402.

Budrys, Vitolis: *See—*
Brown, Francis Barton; and Budrys, Vitolis, 3,781,134.

Buike, Melvin E.: *See—*
Grazen, Frank S.; Buike, Melvin E.; and Bryzinsky, Frank M., 3,781,241.

Bulin, Shelly A., to Case, J. I., Company. Method of making blower housing assembly. 3,780,411, Cl. 29-156.40r.

Bulten-Kanthal Aktiebolag: *See—*
Schrewelius, Nils Gustav, 3,781,528.

Bunting, James H.: *See—*
White, Edward A.; and Bunting, James H., 3,781,852.

Bunzel, Eckard; Spessert, Robert; Rieskamp, Karl; and Hildebrand, Willi, to Ofu Ofenbau-Union GmbH. Industrial furnace. 3,781,166, Cl. 432-126.000.

Burgdorf, Marten, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Method for making hollow bevel gears with integral hollow shaft. 3,780,413, Cl. 29-159.200.

Burger Eisenwerke AG: *See—*
Durth, Wilfried, 3,780,721.

Burghartz, Ernst Albrecht; and Fuss, Hans Guenter. Contruction for the ventilation and air conditioning of rooms of existing buildings. 3,780,638, Cl. 98-31.000.

Burker, Ulf; and Koch, Sigurd, to Siemens Aktiengesellschaft. Programmable fixed data memory utilizing Schottky diodes. 3,781,825, Cl. 340-173.0sp.

Burkle, Erwin; and Loebe, Felix, to Krauss-Maffel Aktiengesellschaft. Feeding attachment for machine processing foamable plastic materials. 3,780,995, Cl. 259-193.000.

Burns, Eugene A.; and Jones, Robert J., to TRW Inc. Pyrolytic polymerization catalyst. 3,781,247, Cl. 260-78.40d.

Burroughs Corporation: *See—*
Wymore, Charles E.; and Dahlberg, Clayton P., 3,781,812.

Burth, Willi. Supply and take-up system for film and the like. 3,780,959, Cl. 242-55.180.

Busch, Norbert: *See—*
Mauvernay, Roland Yves; Busch, Norbert; Simond, Jacques; and Moleyre, Jacques, 3,781,432.

Busch, Peter: *See—*
Story, Paul R.; and Busch, Peter, 3,781,303.

Bush, Ian E., to United States of America, Health, Education and Welfare. Mixer-separator for automated analytical chemistry system. 3,780,936, Cl. 233-20.00r.

Bushtedt, Jury Petrovich: *See—*
Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Dudko, Daniil Andreevich; Arkhangelsky, Georgy Alexandrovich; Pogoretsky, Georgy Ivanovich; Volgin, Leonid Alexandrovich; Kotov, Viktor Anatolievich; Surnin, Boris Anatolievich; and Degtyarev, Mikhal Vasilievich, 3,780,927.

Busson, Christian: *See—*
Alagy, Jacob; and Busson, Christian, 3,781,344.

Butler, Lawrence: *See—*
Barnard, Mark Cary Sedgwick; and Butler, Lawrence, 3,780,791.

Byers, Robert A., to Bell & Howell Company. Playback system with frequency equalization by cascaded circuits performing in accordance with partial fraction expansions of factorial equalizing function terms. 3,781,488, Cl. 179-100.20k.

C & W Sewing Machine: *See—*
Shuffield, Jack E., 3,780,680.

Cahoy, Roger P.; and Sanjean, John, to Gulf Research & Development Company. Carbamyloxybenzylidenemalononitrile insecticides. 3,781,446, Cl. 424-300.000.

Caiati, Frank P.; and Wight, David C., to General Motors Corporation. Solid state crash recorder. 3,781,824, Cl. 340-172.500.

Cairns, James; and Walton, Nicholas, to Garlock, Inc. Composite bearings. 3,781,205, Cl. 252-12.600.

Caleskie, Vincent J.; Hughes, Paul T.; and Johnson, Robert Wayne, to Protection Devices, Inc. Anti-hijacking and theft control systems for motor vehicles. 3,781,789, Cl. 340-64.000.

Caliri, Charles T.: *See—*
Uhtenwoldt, Herbert R.; Crossman, Richard E.; and Caliri, Charles T., 3,781,070.

Callahan, William H.; and Horvath, Stephen I., to Lektro-Vend Corporation. Vending machine. 3,780,909, Cl. 221-85.000.

Cameron Iron Works, Inc.: *See—*
Pennington, John V., 3,780,756.

Campagnuolo, Carl J., to United States of America, Army. Electrical power for fuze activation. 3,781,575, Cl. 310-8.800.

Campari, Luigi: *See—*
Teagno, Vladimiro; and Campari, Luigi, 3,781,766.

Campbell, Matthew Teasdale, to Fork Lift Truck Patentees Establishment. Load handling vehicle. 3,780,895, Cl. 214-770.000.

Campman, James P., to Vidar Laboratories Inc. Intrusion detecting apparatus and method. 3,781,842, Cl. 340-258.00b.

Candor, James T. Flexible skirt construction for a vacuum cleaning nozzle and the like. 3,780,398, Cl. 15-415.000.

Canfield, Richard; and Nafziger, Nelson. Milk processing system. 3,780,644, Cl. 99-455.000.

Cantrell, Ronald G., to Houdaille Industries, Inc. Rigidly attached resilient buckling column bumper support systems. 3,781,049, Cl. 293-99.000.

Capowski, Robert S.: *See—*
Ahearn, Thomas P.; Capowski, Robert S.; Christensen, Neal T.; Gannon, Patrick M.; Lee, Arlin E.; and Liptay, John S., 3,781,808.

Caputo, Anthony J.: *See—*
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Carlsson, Lars Anders Fritz; Helgstrand, John Erik; Sjoberg, Berndt Olof Harald; and Stjernstrom, Nils Erik, to Aktiebolaget Astra Sodertalje. Fluoro-pyridine derivatives and therapeutically acceptable salts thereof. 3,781,280, Cl. 260-240.00j.

Carlton, Alvar G.: *See—*
Pardoe, Carroll T.; Carlton, Alvar G.; and Appel, Robert L., 3,781,818.

Carmichael, Charles J.; and Franklin, Albert G. Method for separating oil from a mixture of oil and waste water from an offshore rig. 3,781,201, Cl. 210-27.000.

Carnanhan, Robert D.; and Youtsey, Karl J., to Universal Oil Products Company. Coupling arrangement for providing uniform velocity distribution for gas flow between pipes of different diameter. 3,780,772, Cl. 138-37.000.

Carney, Murray C., to Sangamo Electric Company. Multiple day recording chart pack. 3,781,906, Cl. 346-137.000.

Caroon, Robert L.: *See—*
Anderson, Thomas W.; and Caroon, Robert L., 3,781,837.

Carriere Technical Industries, Ltd.: *See—*
Glew, Brian G., 3,781,656.

Carroll, Ronnie D., to Pfizer Inc. Dioxo-thiozolidinyl derivatives of 6-aminopenicillanic acid. 3,781,277, Cl. 260-239.100.

Carrotte, Frederick Henry: *See—*
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Carter, Hugh: *See—*
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Case, J. I., Company: *See—*
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Davis, Charles J.; and Glass, Billy M., 3,780,813.
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Cassidy, John Edward: *See—*
Birchall, James Derek; Cassidy, John Edward; and Smith, Frank, 3,781,239.
Castoe, John H., to Branick Manufacturing Company. Bushing repairing method and tool. 3,780,988, Cl. 254-100.000.
Caterpillar Tractor Company: *See—*
Frey, Dennis W., 3,780,822.
C.A.V. Limited: *See—*
Fenne, Ivor, 3,780,716.
Cayton, Thomas C., Jr., to Motorola, Inc. Tape head indexing and shifting apparatus. 3,781,018, Cl. 274-4.00a.
Cecchin, Gildo; and Hilbert, Francis H., to Motorola, Inc. Signal processing circuit for a color television receiver. 3,781,701, Cl. 330-30.00d.
Celanese Canada Limited: *See—*
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Celanese Corporation: *See—*
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Cellu Products Company: *See—*
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Centre Europeen de Recherches Mauvernay: *See—*
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Centre National d'Etudes Spatiales (CNES): *See—*
Ancona, Cesar; and Choquer, Jean, 3,781,894.
Ceroke, Clarence J.: *See—*
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Cerwenka, Peter: *See—*
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Chabardes, Pierre; and Querou, Yvon, to Rhone-Poulenc S.A. Ruthenium catalyzed process for the alkylation of ketones. 3,781,307, Cl. 260-347.800.
Champion International Corporation: *See—*
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Vassiliades, Anthony E.; and Nauman, Edward F., 3,781,230.
Chandler Evans, Inc.: *See—*
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Chandler, Jasper S., to Eastman Kodak Company. Modular structure for viewing apparatus. 3,781,102, Cl. 353-26.000.
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Chapman, Frederic Frank, to Hawker Siddeley Canada Ltd. Sawing and chipping machine. 3,780,778, Cl. 144-39.000.
Chapman, Leonard A., to Eagle Machine Company, Limited. Tobacco harvester. 3,780,507, Cl. 56-27.500.
Chapman, Steven J., to Warwick Electronics, Inc. Pincushion distortion correction circuit. 3,781,590, Cl. 315-27.0sr.
Charboneau, Ben J., to Sno-Start, Inc. Series type solid state voltage regulator which provides constant voltage to a storage device. 3,781,632, Cl. 320-39.000.
Charlton, Gregory G., to International Telephone and Telegraph Corporation. Wide-angle planar-beam antenna adapted for conventional or doppler scan using laterally flared reflector. 3,781,897, Cl. 343-836.000.
Chase-Shawmut Company, The: *See—*
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Chemische Werke Albert: *See—*
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Chemische Werke Huls Aktiengesellschaft: *See—*
Wolpers, Jurgen, 3,781,250.
Chen, Allen S. Surgical valve assembly for urinary bladder irrigation and drainage. 3,780,736, Cl. 128-231.000.
Chernykh, Viktor Vasilievich: *See—*
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich, 3,780,428.
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Grubbs, Conway E.; and Anderson, Dale R., 3,781,512.
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Ching, Yau Chau, to Bell Telephone Laboratories, Incorporated. Differential pulse code communications system having dual quantization schemes. 3,781,685, Cl. 325-38.00b.
Ching, Yau Chau, to Bell Telephone Laboratories, Incorporated. Differential pulse code communications system having dual quantization schemes. 3,781,686, Cl. 325-38.00b.
Chino, Yasuyoshi: *See—*
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Chirkov, Nikolai Mikhailovich: *See—*
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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Allyl ethers. 3,781,309, Cl. 260-348.00r.
Chomet, Marc; and Ellison, Donald E., to Sanders Associates Inc. Television surveillance system. 3,781,468, Cl. 178-6.800.
Chono, Masazumi; Nakajima, Hitoshi; Taguchi, Masayoshi; and Matsuo, Noriaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing methacrylic acid and its esters. 3,781,336, Cl. 260-486.00d.
Choquer, Jean: *See—*
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Christensen, Neal T.: *See—*
Ahearn, Thomas P.; Capowski, Robert S.; Christensen, Neal T.; Gannon, Patrick M.; Lee, Arlin E.; and Liptay, John S., 3,781,808.
Christian, Joseph Robert; Goubau, Georg J. E.; and Mink, James W., to United States of America, Army. Self aligning beam waveguide having a series of lenses and means for maintaining said lenses in alignment. 3,781,546, Cl. 250-201.00r.
Christopher, Charles A.; Allen, Joseph C.; and Kolaian, Jack H., to Texaco Inc. Secondary recovery method. 3,780,808, Cl. 166-275.000.
Chrysler Corporation: *See—*
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Ciba-Geigy AG: *See—*
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Beriger, Ernst, 3,781,427.
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Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,781,357.
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Citizen Watch Co., Ltd.: *See—*
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Claps, William A., to Coulter Electronics, Corporation. Noise discriminating circuitry and method for electronic particle study apparatus. 3,781,674, Cl. 324-71.0cp.
Clark Equipment Company: *See—*
Walton, William Byron, 3,781,565.
Clark, Robert P.; and Freifeld, Milton, to GAF Corporation. Thickened acid compositions and methods for making same. 3,781,203, Cl. 252-8.55c.
Clark, Samuel A., Jr., to United States of America, Army. Protective metal cap for plastic fuze radomes. 3,780,661, Cl. 102-70.02p.
Clarkin, Edward J.; and Conlee, George D., to Nooter Corporation. Corner construction for reinforcing rib on tank made from thin sheet metal. 3,780,903, Cl. 220-71.000.
Clavin, Edward A.; and Wheeler, Lionel H., to CRC-Crose International, Inc. Pipe bending die. 3,780,591, Cl. 72-465.000.
Clemens, David H.; and Kunin, Robert, to Rohm & Haas Company. Removal of sulfur troxide and acid mist from gaseous streams. 3,780,500, Cl. 55-73.000.
Clifford, Richard P., to TRW Inc. Gradient cone thermal radiation sensor. 3,781,561, Cl. 250-352.000.
Clinitex, Inc.: *See—*
De Guillebon, Henri F., 3,780,979.
Cobb, Mack R.: *See—*

Lind, Archie L.; and Cobb, Mack R., 3,780,551.
Cochran, David S.; and Osborne, Thomas E., to Hewlett-Packard Company. Portable electronic calculator. 3,781,820, Cl. 340-172.500.
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Coded Signatures, Inc.: *See—*
Mayer, George L., Jr.; and Dobbins, David L., 3,781,109.
Colburn, Walter E.; Trowern, Howard M., Jr.; and Kerfoot, Franklin W., Jr., to Parke, Davis & Company. System for remote control of package-dispensing station. 3,780,907, Cl. 221-2.000.
Cole, Clyde C. Beam arrangement for handling heavy elongate objects by power machinery. 3,781,054, Cl. 294-81.00r.
Cole, Edward N., to General Motors Corporation. Stratified charge rotary combustion engine. 3,780,707, Cl. 123-8.130.
Cole, Raymond C., to International Playtex Corporation. Breast cup construction. 3,780,741, Cl. 128-516.000.
Coleman, Aaron H.; and Stewart, Hugh W., to CPS Associates, Inc. Automatic publications systems and method. 3,781,816, Cl. 340-172.500.
Coleman Company, Inc., The: *See—*
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Coleman, Richard J.; Foster, David J.; Loper, Edward J., Jr.; and Sundeen, Arthur R., to General Motors Corporation. Magnetic fluid hydrodynamic bearing. 3,780,593, Cl. 74-5.00r.
Coleman, William Earl; and Kessler, Clarence William, to National Cash Register Company, The. Plasma charge transfer device. 3,781,600, Cl. 315-169.0tv.
Colgate-Palmolive Company: *See—*
McDonnell, Robert William; and Win, Maung Hla, 3,781,228.
Collins, Edward, IV: *See—*
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Collins, Jack T., to Automation Industries, Inc. Ultrasonic inspection device. 3,780,570, Cl. 73-67.50r.
Collins, Jerry H., to Esso Research and Engineering Company. Use of 4-chloro-3,5-dinitrobenzenesulfonamide as a fungicide. 3,781,441, Cl. 424-321.000.
Collins Radio Company: *See—*
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Johnson, Frederick W., 3,781,764.
McCollum, James H., Jr., 3,781,912.
Robinson, Eugene A., 3,781,613.
Colombo, Sergio; Carugati, Vitaliano; Ferramola, Gianni; and Ferrari, Sergio, to Raytheon Company. Radiographic display system with cassette lock. 3,781,557, Cl. 250-326.000.
Colsen, F. Thomas: *See—*
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Contri, Bruno: *See—*
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Marsh, Robert W.; and Mooers, Alden J., 3,781,114.
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Widmayer, Don F., 3,781,598.
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Andrews, Barry Stewart; Fitzgerald, Desmond Elwyn; and Lewis, Ian Edward, 3,781,001.
Cooper, Erwin E.; and Kennedy, Howard V., to Texas Instruments, Incorporated. Variable field of view scanning system. 3,781,559, Cl. 250-334.000.
Coordes, John E., to United States of America, Army. Land vehicle. 3,780,819, Cl. 180-14.00a.
Copes, Joseph P.: *See—*
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Corbellini, Margherita; and Balducci, Agostino, to Snam Progetti S.p.A. Novel diamidodialanes and process for the preparation thereof. 3,781,318, Cl. 260-448.00r.
Cordelle, Claude: *See—*
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Corderoy, Henry Morgan, to ACI Operations Pty. Limited. Apparatus for packing bottles, jars or like into cases. 3,780,492, Cl. 53-247.000.
Corning Glass Works: *See—*
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Cornwell Company, Inc.: *See—*
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Corson, Charles A., to Westinghouse Electric Corporation. PFN voltage regulator. 3,781,690, Cl. 328-67.000.
Couchoud, Paul; and Rochina, Vincent, to Societe Rhodiaceta. Process for producing elastic filaments and bristles. 3,781,400, Cl. 264-210.00f.
Coulter Chemistry, Inc., mesne: *See—*
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Coulter Electronics, Corporation: *See—*
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Courard, Camille Alphonse, to Centre de Rechercher Metallurgigues Brussells. Dual coaxial tuyeres. 3,781,002, Cl. 266-41.000.
Courbon, Jean. Method of making skew elements of prestressed concrete. 3,781,401, Cl. 264-228.000.
Courtaulds Limited: *See—*
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Coyne, Roy J.: *See—*
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CPS Associates, Inc.: *See—*
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Crabtree, Bruce L., Sr.: *See—*
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Cragg, William D.; Bradshaw, Leslie E. B.; Batchelor, Anthony C.; and Carter, Ronald D., to International Standard Electric Corporation. Headset. 3,781,492, Cl. 179-156.00a.
Cragoe, Edward J., Jr., to Merck & Co., Inc. Diuretic formulations. 3,781,430, Cl. 424-246.000.
Cramer, Bernhard; Domig, Herbert; Von Keller, Theodor; and Schmeykal, Rudolf, to International Standard Electric Corporation. Device for character recognition. 3,781,800, Cl. 340-146.30f.
Crawford, John T., to Towmotor Corporation. Lift truck fork retaining pins. 3,780,896, Cl. 214-731.000.
CRC-Crose International, Inc.: *See—*
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Crooks, Stanley R.: *See—*
Westergren, George A.; Fish, Warren H.; Crooks, Stanley R.; and Koland, David G., 3,781,460.
Crossman, Richard E.: *See—*
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Crounse, Nathan N.; and Desai, Kantilal B., to Sterling Drug Inc. Stilbene optical brighteners. 3,781,279, Cl. 260-240.0ca.
Crouse, Clifford F.: *See—*
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Crouter, John A.; and Havas, Richard J. Dose syringe. 3,780,735, Cl. 128-223.000.
Crouzet: *See—*
Derre, Andre; Robert, Pierre; and Vuillemin, Claude, 3,780,858.
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Cupler, John A., II: *See—*
Cupler, John A., II; and Stone, Wayne B., Jr. (said Stone assor. to said), 3,780,406.
Cupler, John A., II; and Stone, Wayne B., Jr., said Stone assor. to said Cupler, John A., II. Machining center employing cam operated tool changer. 3,780,406, Cl. 29-26.00a.
Curtis, Flora K. Watch bracelet. 3,780,918, Cl. 224-4.00h.
Curtiss, Robert H.; Holzman, Richard; and Lazarow, Seldan A., to Nortec Computer Devices Inc. High speed print hammer with dynamic damper means. 3,780,648, Cl. 101-93.00c.

Curtiss, Walter W., Jr., to Goodyear Tire & Rubber Company, The. Triangulated carcass tire. 3,780,783, Cl. 152-356.000.

Cutler-Hammer, Inc.: *See—*
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Cuzzone, Raymond, to General Electric Company. Expulsion fuse and support means. 3,781,746, Cl. 337-204.000.

Cvijanovic, Alex; and Firnkas, Sepp, to Tac House, Inc. Building construction and method of same. 3,780,480, Cl. 52-227.000.

Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, to ZF-Borg Warner GmbH Industriegebit. Planet carrier for planetary-gear transmission. 3,780,601, Cl. 74-762.000.

Dahlberg, Clayton P.: *See—*
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Daikin Kogyo Co., Ltd.: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
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Dalziel, Donald F.; and Heide, Charles H., to Webster Electric Company, Inc. Thermally actuated switch. 3,781,742, Cl. 337-77.000.

Dam Fine Products Corporation: *See—*
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Dameca A/S: *See—*
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D'Amico, Frank V.: *See—*
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D'Amico, John Joseph, to Monsanto Company. Cyanoisothiazolyl bis(dithio-carbamates). 3,781,285, Cl. 260-247.100.

Damron, John W., to Dana International Ltd. Heating apparatus. 3,781,526, Cl. 219-538.000.

Dana International Ltd.: *See—*
Damron, John W., 3,781,526.

D'Angelo, Nicola. Reciprocating saw chuck. 3,781,025, Cl. 279-83.000.

Daniel, Curtis M. Jack stick connector. 3,780,774, Cl. 139-87.000.

Dardoufas, Kimon Constantine: *See—*
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 3,781,202.

Darmon, Michel, to I.N.R.S. Ground level control system for lifting apparatus with universal type controller for switch assemblies. 3,781,493, Cl. 200-6.00a.

Darredeau, Bernard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of cooling a gaseous mixture and installation therefor. 3,780,535, Cl. 62-40.000.

Darrow, John O. G.; and Vaughn, Thomas C., to Westinghouse Air Brake Company. Fail-safe railroad-highway grade crossing protection system. 3,781,541, Cl. 246-128.000.

Dashew, Stephen S., to La Mesa Industries, Inc. Concrete form liner. 3,780,977, Cl. 249-15.000.

Datavision, Inc.: *See—*
King, William L., 3,781,875.

Datotek, Inc.: *See—*
Goode, George E.; Morgan, Barrie O.; and Branscome, Kenneth M., 3,781,472.

Dauer, Horst; and Hildebrandt, Peter, to Messer Griesheim G.m.b.H., mesne. Apparatus for plasma welding. 3,781,508, Cl. 219-121.00p.

Dauer, John J., Jr.: *See—*
Grunert, Kurt A.; Dauer, John J., Jr.; and Dobrosielski, Stephen S., 3,781,728.

Davidson, James J., to United States of America, Navy. Apparatus for monitoring thickness of evaporated film. 3,781,911, Cl. 324-65.00r.

Davies, Gordon Thomas: *See—*
Ellen, Leonard William; and Davies, Gordon Thomas, 3,781,867.

Davies, John R., to Oliver Machinery Company. Defecting saw. 3,780,777, Cl. 144-3.00n.

Davis, Benjamin; Pearce, Derek Roger; and Phillipps, Gordon Hanley, to Glaxo Laboratories, Limited. Steroid anaesthetics. 3,781,435, Cl. 424-239.000.

Davis, Charles J.; and Glass, Billy M., to Case, J. I., Company. Reel lift and support for bulldozer. 3,780,813, Cl. 172-438.000.

Davis, Claude A.: *See—*
Stendig, Joseph L.; and Davis, Claude A., 3,781,857.

Davis, Norman, to British Iron and Steel Research Association, The. Apparatus for determining the permeability or stress in a moving magnetic strip in two orthogonal directions. 3,781,662, Cl. 324-34.0st.

Davis, Paul H., to Dukane Corporation. Ultrasonic rigid horn assembly. 3,780,926, Cl. 228-1.000.

Davis, Paul Trevor; Glover, Terence George; and Jones, John Robert, to BP Chemicals International Limited. Process for the production of gaseous olefins from petroleum distillate feedstocks. 3,781,195, Cl. 208-57.000.

Davis, Richard K., to General Electric Company. Voltage ratio discriminator. 3,781,698, Cl. 329-178.000.

Davis, Ronald L., to Sun Research and Development Co. Preparation of 2-pyrrolidinone. 3,781,298, Cl. 260-326.5fn.

Davis, William A., to General Motors Corporation. Removable vehicle body closure with dual use installation. 3,781,059, Cl. 296-137.013.

Dawson, Peter G. Signal light for emergency vehicle. 3,781,790, Cl. 340-97.000.

De Burgh, Raymond J.; and Novick, Harold L., to DeBurgh, Raymond J. Night viewing system for reading without light. 3,781,560, Cl. 250-333.000.

De Caro, Artitide R., to Westinghouse Electric Corporation. Triple purpose heat shield, light collector and mount support for a tungsten-halogen projection lamp. 3,781,582, Cl. 313-37.000.

De Filipps, Fred A., to Fifth Third Bank, The, mesne. Collapsible saddle rack. 3,780,971, Cl. 248-309.000.

De Gruyl, Johannes Albertus, to Cutler-Hammer, Inc. High isolation circulator arrangement for low noise reflection type amplifiers. 3,781,704, Cl. 330-53.000.

De Guillebon, Henri F., to Clinitex, Inc. Adjustable fundus illumination. 3,780,979, Cl. 351-16.000.

De Lapp, Darwin Fiske: *See—*
Ramsey, Wallace Burton; and De Lapp, Darwin Fiske, 3,781,349.

De Longueville, Jacques Charles; Perfetti, Jacques Felix Charles; and Kessler, Ernst Jakob, to Etat Francais represente par le Ministre d'Etat Charge de la Defense Nationale. Undersized-caliber projectile with detachable sabot. 3,780,658, Cl. 102-52.000.

De Vivy, Dominque Le Febve, to Sulzer Brothers Limited. Method of controlling the feed of forced circulation steam generators. 3,780,705, Cl. 122-451.00r.

De Vries, Robert C.: *See—*
Borom, Marcus P.; and De Vries, Robert C., 3,781,522.

De Vries, Robert Wopke, to Wolverine Brass Works; a division of Wolverine Industries, Inc. Non-metallic cartridge valve. 3,780,758, Cl. 137-454.600.

Dean, Robert: *See—*
Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Dean, Robert, 3,781,381.

DeAngelis, Willie G., to PPG Industries, Inc. Handling glass-plastic assemblies. 3,781,003, Cl. 269-40.000.

Deaton, David W., to Deaton Medical Company. Method and apparatus of medical suction. 3,780,738, Cl. 128-277.000.

Deaton Medical Company: *See—*
Deaton, David W., 3,780,738.

DeBoer, Jan; and Vaes, Petrus Jozephus Johannes, to U.S. Philips Corporation. Hair-clipping cutter system. 3,780,434, Cl. 30-34.000.

DeBurgh, Raymond J.: *See—*
De Burgh, Raymond J.; and Novick, Harold L., 3,781,560.

Deep Oil Technology Inc.: *See—*
Horton, Edward E., 3,780,685.

Deere & Company: *See—*
Bichel, Darwin Carl; and Malcolm, Robert La Verne, 3,780,851.
Pettengill, Donald Herbert; and Bass, Merlyn Duane, 3,780,505.
Ransford, Neil Edward; Gilbert, Leland Glen; and Hunger, Richard Herman (said Ransford and said Gilbert, assors. to said), 3,781,056.
Schneider, Kenneth Roger, 3,780,839.

Deerfield, Alan J., to Raytheon Company. Method and apparatus for applying source language statements to a digital computer. 3,781,814, Cl. 340-172.500.

Deering Milliken Research Corporation: *See—*
Short, Joe T., 3,780,678.

Deev, Stanislav Lvovich: *See—*
Dolgov, Anatoly Vladimirovich; Konovalov, Leonid Vladimirovich; Perkis, Leib Benyaminovich; Deev, Stanislav Lvovich; Dyakov, Vitaly Evgenievich; Semenov, Alexandr Efimovich; Bauer, Evgeny Teodorovich; and Suturin, Serafim Nikolaevich, 3,780,864.

Degtyarev, Mikhail Vasilievich: *See—*
Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Dudko, Daniil Andreevich; Arkhangelsky, Georgy Alexandrovich; Pogoretsky, Georgy Ivanovich; Volgin, Leonid Alexandrovich; Kotov, Viktor Anatolievich; Surnin, Boris Anatolievich; and Degtyarev, Mikhal Vasilievich, 3,780,927.

Deisch, Cecil Winston, to Bell Telephone Laboratories, Incorporated. Line feed and isolation transformer with integral loop supervision. 3,781,483, Cl. 179-18.00f.

DeLange, Cornelis J., to Cement Enamel Development, Inc. Prefabricated structural unit and method. 3,780,482, Cl. 52-309.000.

Deli, Jack M.; and Hehmiz, Ramiz Y., to International Harvester Company. Track pin and bushing seal assembly. 3,781,066, Cl. 305-11.000.

Delignieres, Robert, to Institut Francais du Petrole des Carburants et Lubrifiants. Method for determining the distance travelled over by vehicle with respect to a reference surface, making use of the doppler's effect and device therefor. 3,781,774, Cl. 34-3.00d.

Demarco, Thomas M.: *See—*
Dupre, George T.; and Demarco, Thomas M., 3,780,502.

Deniega, Jose Castillo; and Tellerman, Edward M., to Wesco Industries Corporation, mesne. Yarn feeding and storage device for textile producing machine. 3,780,958, Cl. 242-47.120.

Denki Onkyo Co., Ltd.: *See—*
Takiguchi, Hisashi, 3,781,750.

Dennstedt, Welf, to Varta Aktiengesellschaft. Method and apparatus for determining and indicating the state of charge of nickel cadmium batteries. 3,781,657, Cl. 324-29.500.

Derre, Andre; Robert, Pierre; and Vuillemin, Claude, to Crouzet. Device for automatically presenting documents on a reading table. 3,780,858, Cl. 209-73.000.

Desai, Kantilal B.: *See—*
Crounse, Nathan N.; and Desai, Kantilal B., 3,781,279.

Desbrandes, Robert, to Institut Francois du Petrole des Carburants et Lubrifiants. Method and devices for determining characteristics of geological formations by transmission of acoustic signals. 3,781,784, Cl. 340-15.500.

Design Center, Inc., mesne: *See—*
Menkel, Gary G., 3,780,898.

Design Elements, Inc.: *See—*
Fretwell, Richard D.; Azbell, James W.; and Mason, Edwin E., 3,781,817.

Detotek, Inc.: *See—*
Goode, George E.; and Branscome, Kenneth M., 3,781,473.

Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Dispersing and stabilizing agents for dyestuffs. 3,781,169, Cl. 8-34.000.

Deubner, Rolf: *See—*
Stadie, Werner; Sperling, Kurt; Deubner, Rolf; and Pattberg, Werner, 3,780,747.

Develco, Inc.: *See—*
Rorden, Louis H., 3,781,664.

Development Technology, Inc.: *See—*
Primmer, Charles A., 3,781,838.

Dewitt, William J.: *See—*
Tuvell, Melvin E.; and Dewitt, William J., 3,781,339.

Dheilly, Jacky, to U.S. Philips Corporation. Current supply comprising an asymmetric rectifier arrangement. 3,781,646, Cl. 321-47.000.

Di Chen, Enrique Bernal G., to Honeywell Inc. Optical mass memory. 3,781,905, Cl. 346-74.0mt.

Diagnostic Data, Inc.: *See—*
Huber, Wolfgang, 3,781,414.

Diamond Electric Manufacturing Co., Ltd.: *See—*
Ishida, Yoshio, 3,781,649.

Diamond International Corporation: *See—*
Baker, Leroy D., 3,780,493.

Dick, Rudolf, to Wandel u. Goltermann. System for measuring amplitude and phase distortion. 3,781,669, Cl. 324-57.00r.

Dickenson, Richard W.; deceased (by Dickenson, Winifred), to Anchor Hocking Corporation. Mast stabilizer for lift trucks. 3,780,831, Cl. 187-9.000.

Dickenson, Winifred: *See—*
Dickenson, Richard W., 3,780,831.

Dickinson, W. H., Engineering Limited: *See—*
Allen, Edward James, 3,780,886.

Dickopp, Gerhard: *See—*
Batsch, Helmut; Jahnel, Benno; Weinz, Ernst August; Berger, Wolfgang; and Dickopp, Gerhard, 3,781,020.

Didycz, William J.; and Seabury, Almon D., to United States Steel Corporation. High service temperature pressure sensitive device. 3,780,793, Cl. 165-47.000.

Diery, Helmut: *See—*
Deubel, Reinhold; Diery, Helmut; Klinner, Wolfgang; List, Karl-Hermann; and Uhrig, Heinz, 3,781,169.

Dietch, Leonard; and Lerner, Martin L., to Zenith Radio Corporation. Cathode ray tube reclamation process. 3,781,076, Cl. 316-2.000.

Dietmann, Karl: *See—*
Kampe, Wolfgang; Fauland, Erich; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 3,781,273.

Dietz, Erich; Ribka, Joachim; and Steckelberg, Willi, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-insoluble phenyl azo naphthylamido-benzimidazolone dyestuff. 3,781,266, Cl. 260-157.000.

Dietze, Wolfgang: *See—*
Reuschel, Konrad; Dietze, Wolfgang; Muhlbauer, Alfred; and Sandmann, Herbert, 3,781,209.

Dillow, Dorris Leon. Fuel vaporizer for internal combustion engines. 3,780,714, Cl. 123-122.0aa.

DiMarco, Bernard; Kussy, Frank W.; and Swain, Kenneth W., said DiMarco and said Kussy assors. to I-T-E Imperial Corporation and said Swain assor. to Chase-Shawmut Company, The. Device for removably mounting electrical component. 3,781,607, Cl. 317-13.00r.

Dingman, S. Lawrence: *See—*
Sellman, Paul V.; Dingman, S. Lawrence; and Atkins, Ronald T., 3,780,578.

Dion, C. Norman; and Maruyama, Dennis T., to Memory Corporation. Method of certifying magnetic recording disc. 3,781,835, Cl. 340-174.10b.

Dipietro, Matthew, to Eastman Kodak Company. Slide tray. 3,781,103, Cl. 353-111.000.

Dishal, Milton; and Baran, Henri, to International Telephone and Telegraph Corporation. Selection and processing system for signals including frequency discriminator. 3,781,705, Cl. 331-17.000.

Dittrich, Volker: *See—*
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,781,301.

Dixon, Roy C.: *See—*
Boudreau, Paul E.; Dixon, Roy C.; Donnan, Robert A.; and Moss, Eual A., 3,781,815.

Dlufosinski, Theodore: *See—*
Farmer, David K.; and Dlufosinski, Theodore, 3,781,062.

Dobbins, David L.: *See—*
Mayer, George L., Jr.; and Dobbins, David L., 3,781,109.

Dobrosielski, Stephen S.: *See—*
Grunert, Kurt A.; Dauer, John J., Jr.; and Dobrosielski, Stephen S., 3,781,728.

Dodson, Merritt E.; Marsh, Richard L.; and Masters, Frank C., to Goodyear Tire & Rubber Company, The. Belt track structure. 3,781,067, Cl. 305-35.0eb.

Doerffer, Jerzy; and Milenuszkin, Walenty. Gear for braking and auxiliary steering ships on braking them. 3,780,683, Cl. 114-145.00r.

Dohany, Julius Eugene, to Pennwalt Corporation. Method of preparing consistently high-quality vinylidene fluoride polymer. 3,781,265, Cl. 260-92.10r.

Dolgov, Anatoly Vladimirovich; Konovalov, Leonid Vladimirovich; Perkis, Leib Benyaminovich; Deev, Stanislav Lvovich; Dyakov, Vitaly Evgenievich; Semenov, Alexandr Efimovich; Bauer, Evgeny Teodorovich; and Suturin, Serafim Nikolaevich. Method and apparatus o refine melts from solid impurities. 3,780,864, Cl. 210-152.000.

Doll, Martin, to Cellu Products Company. Net-like thermoplastic material and products. 3,781,183, Cl. 161-109.000.

Domicone, Joseph J.; and Kozlowski, Theodore R., to Corning Glass Works. Safe bi-modal windshields. 3,781,184, Cl. 161-165.000.

Domig, Herbert: *See—*
Cramer, Bernhard; Domig, Herbert; Von Keller, Theodor; and Schmeykal, Rudolf, 3,781,800.

Dominion Luggage Co., Limited: *See—*
Slan, Jack, 3,780,838.

Domtar Limited: *See—*
Bodycomb, Alistair Kenyon, 3,781,124.

Donche, Alain: *See—*
Pfister, Alain; Arretz, Emmanuel; and Donche, Alain, 3,781,366.

Donjon, Jacques; and Marie, Gerard Joseph Marcel, to U.S. Philips Corporation. Optic relay for scanning by means of a light beam. 3,781,469, Cl. 178-7.03d.

Donnan, Robert A.: *See—*
Boudreau, Paul E.; Dixon, Roy C.; Donnan, Robert A.; and Moss, Eual A., 3,781,815.

Donofrio, David J. Oral thermometer. 3,780,586, Cl. 73-374.000.

Dooley, Philip G.; and Lambiris, Sotiris, to United Aircraft Corporation. Combustion chamber. 3,780,530, Cl. 60-39.690.

Dornberger, Georg Christian Ernst, to Western Electric Company, Incorporated. Apparatus including a pair of dissimilar spaced electrodes for detecting faults in insulated wires. 3,781,666, Cl. 324-54.000.

Dorr, Karl-Heinz; Grimm, Hugo; and Kola, Rolf, to Metallgesellschaft Aktiengesellschaft. System for the liquid-phase removal of a component from the gas stream especially the absorption of sulfur trioxide in sulfuric acid. 3,780,499, Cl. 55-32.000.

Dorr-Oliver Incorporated: *See—*
Miles, Harry Victor, II, 3,780,868.
Schall, Robert A., 3,781,141.

Dorsman, Adrian K.; and Adams, Clark F., to North American Rockwell Corporation. Warp letoff control system. 3,781,532, Cl. 235-151.320.

Dow Chemical Company, The: *See—*
Herrell, Arthur D., 3,780,488.
Larsen, Eric R.; Andrejewski, Bernard R.; and Edamura, Fred Y., 3,781,369.

Dow, Willard, to United States of America, Navy. Neutrally buoyant instrument suspension. 3,781,780, Cl. 340-8.00s.

Downing, Randall William, to Bell Telephone Laboratories, Incorporated. Scheme for saving and restoring register contents in a data processor. 3,781,810, Cl. 340-172.500.

Dowty Hydraulic Units Limited: *See—*
Weaver, Cedric David; and Toogood, Graham John, 3,781,149.

Doyle, William F.; and Artzer, Charles W. Resilient Shock-absorbing bulkhead. 3,780,673, Cl. 105-376.000.

Drabek, Jozef: *See—*
Martin, Henry; and Drabek, Jozef, 3,781,425.

Draiswerke GmbH., Firma: *See—*
Wilhelm Karl-Heinz, 3,780,957.

Drake, Noel Francis. Shaping of hollow metal articles. 3,780,410, Cl. 29-155.00r.

Drawert, Manfred; and Griebsch, Eugen, to Schering AG. Flexible polyamide hot melt adhesive made from ethylene diamine and an acid component containing a polymer fatty acid and heptadicone dicarboxyl acid. 3,781,234, Cl. 260-18.00n.

Dreher, Manfrid, to Dreher, Manfrid, Dr.-Ing., KG. Tumbler with drum transfer apparatus. 3,780,475, Cl. 51-164.000.

Dreher, Manfrid, Dr.-Ing., KG: *See—*
Dreher, Manfrid, 3,780,475.

Dresser Industries, Inc.: *See—*
Arrington, Thomas L.; and Dyer, Norman D., 3,780,816.

Dressler, Ulrich: *See—*
Klupsch, Paul; Paul, Rudolf; and Dressler, Ulrich, 3,780,636.

Drexelbrook Controls, Inc.: *See—*
Maltby, Frederick L.; and Kramer, Jonathan, 3,781,672.

Drexhage, Karl H.; and Reynolds, George A., to Eastman Kodak Company. Laser dye composition. 3,781,711, Cl. 331-94.500.

Drumheller, Kirk. Child proof latches. 3,780,547, Cl. 70-78.000.

Druzynski, Conrad J.: *See—*
Kahwati, Ghassan N.; Gade, John N.; Mac Kay, James D.; and Druzynski, Conrad J., 3,780,961.

Du Pont de Nemours, E. I., and Company: *See—*
Ambrose, William J.; and McErlane, James E., 3,780,984.
Blackstone, Robert Clifford, 3,781,362.
Hartzler, Harris Dale, 3,781,281.
Hermes, Mathew Edward, 3,781,251.
Irwin, Carl F., 3,781,320.

Kosak, John Richard, 3,781,354.
Manacini, Lloyd; and Ysteboe, Howard T., 3,781,760.
Mancini, Lloyd, 3,781,770.
Noddin, Kenneth W.; and Simmons, Walter J., 3,780,752.

Dubuisson, Bernafd Louis Yves, 50% to Societe Francaise d'Optique et de Mecanique S.F.O.Mo. Stereoscopic plotting apparatus 355/022.000. 3,781,104, Cl. .

Dudko, Daniil Andreevich: *See—*
Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Dudko, Daniil Andreevich; Arkhangelsky, Georgy Alexandrovich; Pogoretsky, Georgy Ivanovich; Volgin, Leonid Alexandrovich; Kotov, Viktor Anatolievich; Surnin, Boris Anatolievich; and Degtyarev, Mikhal Vasiievich, 3,780,927.

Dudley, Harvey H.: *See—*
Williams, Francis A.; and Dudley, Harvey H., 3,781,099.

Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, to Ciba-Geigy AG. Bromophenylformamidines. 3,781,356, Cl. 260-564.00r.

Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, to Ciba-Geigy AG. Alkylphenyl- and chlorophenoxyphenyl-formamidines. 3,781,357, Cl. 260-564.00r.

Dukane Corporation: *See—*
Davis, Paul H., 3,780,926.

Dunhill Lighters Limited: *See—*
Ovens, Christopher William, 3,781,163.

Dunlop Holdings Limited: *See—*
Thomson, Richard N.; and Walker, Michael F., 3,781,021.

Dunlop Limited: *See—*
Harrison, Reginald, 3,780,671.
Reus, Walter, 3,780,573.

Dunn, Robert R. Swimming pool cover. 3,780,385, Cl. 4-172.120.

Dupre, George T.; and Demarco, Thomas M., to National Foundry Equipment Company, Inc. Collector apparatus. 3,780,502, Cl. 55-337.000.

Durkee, Earle Frederick, to Microwave Associates, Inc. Passive TR tubes. 3,781,719, Cl. 333-13.000.

Durso, Thomas. Method and apparatus for producing an annular skinless sausage product. 3,781,447, Cl. 426-513.000.

Durth, Wilfried, to Burger Eisenwerke AG. Circulating-air oven with filter. 3,780,721, Cl. 126-21.00a.

Dutton, David R., to Honeywell Information Systems, Inc. D.C.-D.C. power supply with stabilization. 3,781,642, Cl. 321-43.000.

Duty, George Otto, to Jerrold Electronics Corporation. Electronic amplifier with dual automatic slope control. 3,781,703, Cl. 330-52.000.

Dyachkovsky, Fridrikh S.: *See—*
Shilov, Alexandr E.; Dyachkovsky, Fridrikh S.; Chirkov, Nikolai Mikhailovich; Matkovsky, Petr E.; Aronovich, Khaim-Mordkhe; Beikhold, Alina A.; and Russian, Ljudmila, 3,781,220.

Dyakov, Vitaly Evgenievich: *See—*
Dolgov, Anatoly Vladimirovich; Konovalov, Leonid Vladimirovich; Perkis, Leib Benyaminovich; Deev, Stanislav Lvovich; Dyakov, Vitaly Evgenievich; Semenov, Alexandr Efimovich; Bauer, Evgeny Teodorovich; and Suturin, Serafim Nikolaevich, 3,780,864.

Dyer, Norman D.: *See—*
Arrington, Thomas L.; and Dyer, Norman D., 3,780,816.

Dynamic Instrument Corporation: *See—*
Sulger, Harold, Sr., 3,781,751.

E-Z Tow, Inc.: *See—*
Bachel, Francis D.; and Voves, Robert A., 3,781,038.

Eagle Industries, Inc.: *See—*
Morrow, Dennis W., 3,780,878.

Eagle Machine Company, Limited: *See—*
Chapman, Leonard A., 3,780,507.

Eastern Company, The: *See—*
Wilbur, Robert L., 3,780,694.

Eastman Kodak Company: *See—*
Bloemendaal, John F.; and Stockdale, Willis L., 3,780,922.
Brown, Gordon P., 3,780,608.
Chandler, Jasper S., 3,781,102.
Dipietro, Matthew, 3,781,103.
Drexhage, Karl H.; and Reynolds, George A., 3,781,711.
Fay, Robert J.; and Cicotta, John R., 3,781,089.
Horn, Robert F., 3,780,637.
Jenkins, Gerald L.; Jungjohann, Vernon H.; and Marvin, Edgar S., 3,781,100.
Kahwati, Ghassan N.; Gade, John N.; Mac Kay, James D.; and Druzynski, Conrad J., 3,780,961.
Kamp, Leonard F.; and Stoneham, Jeffrey R., 3,780,632.
La Fleur, Bob A.; and O'Brien, Robert J., 3,780,700.
Leenhoots, Donald D., 3,780,391.
Michatek, Chester W., 3,780,633.
Williams, Francis A.; and Dudley, Harvey H., 3,781,099.

Ebner, Ludwig: *See—*
Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,781,356.
Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,781,357.

Ecodyne Corporation, mesne: *See—*
Ovard, John C., 3,780,567.

Ecotrol, Inc.: *See—*
Imris, Pavel, 3,781,601.

Edamura, Fred Y.: *See—*
Larsen, Eric R.; Andrejewski, Bernard R.; and Edamura, Fred Y., 3,781,369.

Edlund, Sven Bertil Gosta; and Sodersten, Bo Frans Ake, to AB Hagglund & Soner. Brake controlling device. 3,780,990, Cl. 254-173.000.

Edson Enterprises, Inc.: *See—*
Tremarco, Paul, 3,781,494.

Educated Vehicle Systems, Inc.: *See—*
Kaufman, Peter; Colsen, F. Thomas; and Townsend, Robert L., 3,781,854.

Edwards Company, Inc.: *See—*
Berns, Charles, 3,781,877.

Edwards, Thomas Philip: *See—*
Locke, Walter Frederick; Watson, Arthur; and Edwards, Thomas Philip, 3,781,039.

Effinger, David D.; Evans, Norol T.; and Estrick, Vaughn H., to Hughes Aircraft Company. Dynamic range control system having amplitude restoration. 3,781,883, Cl. 343-7.00a.

Egan Machinery Company: *See—*
Irving, Edgar W., Jr., 3,780,801.

Eichelberger, William E.; and Wood, Lawrence H., to Corning Glass Works. Projection storage-display system having dynamic graphic capability. 3,781,846, Cl. 340-324.00a.

Eichenhofer, Josef, to Automatic Bar Feed Ltd. Automatic bar feeder attachment for multiple spindle screw machines. 3,780,924, Cl. 226-155.000.

Eigenmann, Ludwig. Light reflecting system. 3,781,083, Cl. 350-105.000.

Ek, Leif V.; Wallin, Per L.; and Tibbling, Thure P. M., to Pharmacia Fine Chemicals AB. Method for the separation of substance mixtures by chromatography and a column means adapted to be used for the method. 3,780,866, Cl. 210-198.00c.

Ekedal, Palmer J. Power drawn collapsible trailer. 3,781,030, Cl. 280-36.00c.

Eklund, Hans Eric, to AB Ljungmans Verkstader. Safety mechanism for automatic nozzles. 3,780,776, Cl. 141-207.000.

Elco Industries, Inc.: *See—*
Lindstrom, Bert A., 3,780,389.

Electricity Council, The: *See—*
Gale, Philip Franklin, 3,781,665.

Electrolytic Zinc Company of Australasia, Limited: *See—*
Allan, Robert William; Haigh, Curzon John; and Hamdorf, John, 3,781,405.

Elektros, Inc.: *See—*
Frye, George J.; and Frisch, Arnold M., 3,781,872.

Elkins, Bobby L., to Lear Siegler, Inc. Shelf divider. 3,780,876, Cl. 211-184.000.

Ellen, Leonard William; and Davies, Gordon Thomas, to Postmaster General, Her Majesty's. Digital control apparatus. 3,781,867, Cl. 340-347.0ad.

Ellett Copper and Brass Company Ltd.: *See—*
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Emerson, Lucian F., to GTE Laboratories, Incorporated. DC signal processing circuit. 3,781,605, Cl. 317-5.000.

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Engeler, William E.; and Garfinkel, Marvin, to General Electric Company. Device for storing information and providing an electric readout. 3,781,827, Cl. 340-173.0ca.

Engelhardt, Alvin, to Technicon Instruments Corporation. Self-locating sample receptacle having integral identification label. 3,781,120, Cl. 356-244.000.

Engelhardt, Friedrich; and Ribka, Joachim, to Casella Farbwere Mainkur Aktiengesellschaft. Process for the production of polymers in the presence of a redox catalyst system. 3,781,254, Cl. 260-85.50r.

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Fenton, Donald M., to Union Oil Company of California. Saturation of unsaturated aldehydes. 3,781,364, Cl. 260-601.00r.
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Fingerle, Karl; and Haag, Jurgen, to Fortuna-Werke Maschinenfabrik Aktiengesellschaft. Guiding device, especially for splitting and beveling machines. 3,780,605, Cl. 83-4.000.
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Fruth, Jonathan N., to General Motors Corporation. Compound air register of one piece construction. 3,780,640, Cl. 98-110.000.
Frye, George J.; and Frisch, Arnold M., to Elektros, Inc. Analog-to-digital conversion for processing wide-range and non-linear input signals. 3,781,872, Cl. 340-347.0ad.
Frye, James A.; Morton, Ralph B.; and Vogler, Charles W., to Boardman Company, The. Plasma arc refuse disintegrator. 3,780,675, Cl. 110-8.00e.
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Fujita, Yutaka; Toda, Toshiki; and Shimada, Tsuneo, to Teijin Limited. Process for preparation of omega-hydroxy saturated aliphatic monocarboxylic acids. 3,781,350, Cl. 260-535.00r.

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Fuller, Oliver C., to Evans Products Company. Hopper shock-absorbing toggle operating mechanism. 3,780,672, Cl. 105-253.000.

Fuller, Ray W.; and Molloy, Bryan B., to Lilly, Eli, and Company. Phenethanolamine N-methyl transferase inhibiting benzylamines. 3,781,443, Cl. 424-330.000.

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Funk, Forrest E.; Oda, Richard T.; Luria, Norman G.; and Margherone, Edward G., to General Electric Company. Electrical penetration assembly. 3,781,453, Cl. 174-11.00r.

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Gaetke, Hubert J. Device for directing food waste into garbage disposal inlet. 3,780,393, Cl. 15-105.000.

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Randall, David I.; and Copes, Joseph P., 3,781,359.

Gagnon, Leo Raymond. Apparatus for aiding blind bowlers. 3,781,009, Cl. 273-54.00b.

Gaheen, Alfred F., to United States of America, Air Force. Satellite inspection radar. 3,781,887, Cl. 343-13.00r.

Gajer, Richard; Skurnia, Uwe; and Richter, Mandred, to Chemische Werke Albert. Continuous production of preformed molding materials. 3,781,397, Cl. 264-142.000.

Galantay, Eugene E., to Sandoz-Wander, Inc. Piperazinyl-substituted-tricyclic compounds as tranquillizers. 3,781,433, Cl. 424-250.000.

Gale, Philip Franklin, to Electricity Council, The. Cable fault location indicator. 3,781,665, Cl. 324-52.000.

Gallay, Jean-Jacques: *See—*
Spaun, Ruediger; Rochat, Alain Claude; Gallay, Jean-Jacques; and Brenneisen, Paul, 3,781,290.

Galli, Remo: *See—*
Minisci, Francesco; Galli, Remo; and Quilico, Adolfo, 3,781,286.

Galli, Richard J.; and Keleman, Denis G. Semiconductor chip carriers and strips thereof. 3,781,596, Cl. 317-101.00f.

Gallo, Charles F., to Xerox Corporation. Light producing system. 3,781,585, Cl. 313-184.000.

Gambell, James W.: *See—*
Roth, James F.; Gambell, James W.; and Penquite, Charles R., 3,781,406.

Gannon, Patrick M.: *See—*
Ahearn, Thomas P.; Capowski, Robert S.; Christensen, Neal T.; Gannon, Patrick M.; Lee, Arlin E.; and Liptay, John S., 3,781,808.

Ganser, Alfred: *See—*
Ganser, Herman; and Ganser, Alfred, 3,781,024.

Ganser, Herman; and Ganser, Alfred. Portable drilling apparatus including a mechanical, recirculating cooling system. 3,781,024, Cl. 279-20.000.

Garbrecht, William L. Cephalosporin process and product. 3,781,282, Cl. 260-243.00c.

Gardner, Delbert J., to Bendix Corporation, The. Pressure differential assist for a servomotor. 3,780,620, Cl. 91-6.000.

Gardner, Jeffrey M., to Container Corporation. Container with load carrying feature. 3,780,934, Cl. 229-52.00b.

Gardom & Lock Limited: *See—*
Gardom, George William, 3,781,520.

Gardom, George William, to Gardom & Lock Limited. Electric instantaneous water heater. 3,781,520, Cl. 219-309.000.

Garfinkel, Marvin: *See—*
Engeler, William E.; and Garfinkel, Marvin, 3,781,827.

Garlock, Inc.: *See—*
Cairns, James; and Walton, Nicholas, 3,781,205.

Garnett, Robert E., to Richard Manufacturing Company. Universal shoulder immobilizing support. 3,780,729, Cl. 128-94.000.

Gaston County Dyeing Machine Company: *See—*
Turner, James Keith; and Riley, James Robert, 3,780,544.

Gavin, Thomas M. Pressure reducing air gun. 3,780,949, Cl. 239-291.000.

Gaylord, Norman G., to Gaylord Research Institute, Inc. Graft copolymers having branches which are alternating copolymers, and processes therefor. 3,781,232, Cl. 260-17.4gc.

Gaylord Research Institute, Inc.: *See—*
Gaylord, Norman G., 3,781,232.

Gebelius, Sven Runo Vilhelm. Convectors. 3,780,797, Cl. 165-55.000.

Gebr. Bohler & Co. AG: *See—*
Holzgruber, Wolfgang; Machner, Peter; Schneihofer, Adolf; Kleinhagauer, Otmar; and Cerwenka, Peter, 3,781,448.

Geczy, Bela: *See—*
Barron, Charles Dwain; Geczy, Bela; and Wilms, Carl Alfred, 3,780,815.

Geiger, Erich, to Loewe Opta GmbH. Fast acting circuitry for DC overload protection. 3,781,608, Cl. 317-20.000.

Geiger, Franklin O.; and Young, James L., to Farrington Business Machines Corporation. Imprinter having independently mounted, preloaded print rollers. 3,780,669, Cl. 101-269.000.

Geist, Robert Joseph, to Union Carbide Corporation. Nozzle shut-off and flow control valve. 3,780,764, Cl. 137-613.000.

Gelak, Richard: *See—*
Jacoby, Joseph M.; and Gelak, Richard, 3,780,458.

Genbauffe, Francis S., to Robertshaw Controls Company. Control system and control device therefor or the like. 3,780,940, Cl. 236-15.00a.

Genbauffs, Francis S., to Robertshaw Controls Company. Burner construction. 3,780,954, Cl. 239-560.000.

General Electric Company: *See—*
Aftergot, Siegfried, 3,781,080.
Anderson, Thomas E.; and Walden, John P., 3,781,638.
Barnes, Emmett W., 3,781,757.
Bennett, Moreland P., 3,781,513.
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Borom, Marcus P.; and De Vries, Robert C., 3,781,522.
Borom, Marcus P., 3,781,523.
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Kantor, Simon W.; and Juliano, Peter C., 3,781,378.
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Neugebauer, Constantine A.; and Mundy, Joseph L., 3,781,831.
Parker, Rollin J., 3,781,736.
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Schumacher, Walter C.; and Graves, Ralph L., 3,781,502.
Scott, Paul F.; Radecki, Kenneth P.; and Tatge, Robert B., 3,781,782.
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Steigerwald, Robert L., 3,781,505.
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Samuels, Philip Rufus, 3,781,595.

General Instrument Corporation: *See—*
Brand, Abraham, 3,781,489.

General Marine, Inc.: *See—*
Jordan, Richard J., 3,780,757.

General Motors Corporation: *See—*
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Brooks, Frank W., 3,781,068.
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Cole, Edward N., 3,780,707.
Coleman, Richard J.; Foster, David J.; Loper, Edward J., Jr.; and Sundeen, Arthur R., 3,780,593.
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Freeman, Wayne E., 3,780,933.
Fruth, Jonathan N., 3,780,640.
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Herman, Stanley W., 3,780,422.
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Johnson, Douglas, 3,780,529.
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General Science Corp.: *See—*
Angel, Henry R., 3,781,675.

General Signal Corporation: *See—*
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Geng, Hellmuth R.; Hajdu, Johann; and Skuin, Petar, to International Business Machines Corporation. Shift unit for variable data widths. 3,781,819, Cl. 340-172.500.

Genuit, Luther L.; and Nowell, John R., to Honeywell Information Systems, Inc. Lead network to prevent voltage overshoot in a switching regulator. 3,781,636, Cl. 321-9.00r.

George, Wilberdan Victor: *See—*
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Gerace, Robert E., to Xerox Corporation. Control system. 3,781,548, Cl. 250-206.00r.

Gerber Garment Technology, Inc.: *See—*
Gerber, Heinz Joseph, 3,780,607.

Gerber, Heinz Joseph, to Gerber Garment Technology, Inc. Method and apparatus for cutting sheet material. 3,780,607, Cl. 83-49.000.

Gerber, Heinz Joseph, to Gerber Scientific Instrument Company, The. Apparatus for expressing writing fluid from a plotting pen. 3,781,907, Cl. 346-140.000.

Gerber Scientific Instrument Company, The: *See—*
Gerber, Heinz Joseph, 3,781,907.

Gerico, Inc.: *See—*
Hansson, Margaret S., 3,780,919.

Gerst, Thomas E.; and Webb, John G., Jr., to United States of America, Atomic Energy Commission. Biphase radio-frequency modulator. 3,781,716, Cl. 332-9.00r.

Gertsch, Ernst; and Gertsch, Ulrich. Safety ski binding. 3,781,028, Cl. 280-11.350.

Gertsch, Ulrich: *See—*
Gertsch, Ernst; and Gertsch, Ulrich, 3,781,028.

Geusic, Joseph Edward, to Bell Telephone Laboratories, Incorporated. Single wall magnetic domain generator. 3,781,833, Cl. 340-174.0tf.

Ghafghaichi, Majid: *See—*
Baker, Thoedore H.; Ghafghaichi, Majid; and Totta, Paul A., 3,781,609.

Gibbons, Loren Kenneth, to FMC Corporation. Arylisoxazoles as nematicides. 3,781,438, Cl. 424-272.000.

Gibson, James William; and Gibson, James William, Jr. Match holder. 3,781,051, Cl. 294-1.00r.

Gibson, James William, Jr.: *See—*
Gibson, James William; and Gibson, James William, Jr., 3,781,051.

Gicca, Francis A.; Passavant, Francis C.; and Worters, Allen J., to GTE Sylvania Incorporated. Television type display system for displaying information in the form of curves or graphs. 3,781,850, Cl. 340-324.0ad.

Giebel, Joseph L.; and Temple, Ernest E., to Mine Safety Appliances Company. Self-cocking explosively actuated cable cutter. 3,780,689, Cl. 114-221.00a.

Gilbert, Charles E., Jr.: *See—*
Lilienthal, Alfred J.; Johnson, Theodore F.; Petri, William E., Jr.; and Gilbert, Charles E., Jr., 3,780,423.

Gilbert Flexi-Van Corporation: *See—*
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Gilbert, Leland Glen: *See—*
Ransford, Neil Edward; Gilbert, Leland Glen; and Hunger, Richard Herman, 3,781,056.

Gilbert, Lynford W.: *See—*
Rushing, Frank C.; and Gilbert, Lynford W., 3,781,095.

Giles, William A.: *See—*
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Gillemot, George K.: *See—*
Thompson, John T.; and Gillemot, George K., 3,781,461.

Gillet, Roger: *See—*
Lehuen, Christian; and Gillet, Roger, 3,781,581.

Gillette Company, The: *See—*
Martin, James M.; and Thomas, Michael D., 3,781,519.

Gillimot, George W.: *See—*
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Gimbel, Frederick M.: *See—*
Acre, Thomas R.; Gimbel, Frederick M.; and Ramacheandran, Sundaresan, 3,780,581.

Girling Limited: *See—*
Harrison, Anthony William, 3,780,835.
Newstead, Charles, 3,780,836.
Taft, Philip Augustus, 3,781,064.

Gitlitz, Melvin H., to M & T Chemicals Inc. Tri-2-norbornyltin compounds. 3,781,316, Cl. 260-429.700.

Gittinger, Norman C., to General Electric Company. Hybrid band pass-band stop filter. 3,781,718, Cl. 333-11.000.

Giurgea, Corneliu Edmond, to UCB, Societe Anonyme. Therapeutic compositions. 3,781,436, Cl. 424-258.000.

Givaudan Corporation: *See—*
Kappeler, Heinrich; and Wild, Jost, 3,781,333.
Polinski, Leon M.; and Sonn, Milton M., 3,781,372.

Gladden, David J., to Coleman Company, Inc., The. Synchronous reciprocating electrodynamic compressor system. 3,781,140, Cl. 417-326.000.

Gladstone, Shaul: *See—*
Smith, Kenneth Burton; and Gladstone, Shaul, 3,780,566.

Glaser, Peter E., to Little, Arthur D., Inc. Method and apparatus for converting solar radiation to electrical power. 3,781,647, Cl. 322-2.000.

Glass, Billy M.: *See—*
Davis, Charles J.; and Glass, Billy M., 3,780,813.

Glass, Marvin, & Associates: *See—*
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Glavna Directzia KBUMDP pri SGNS: *See—*
Anastasov, Ivan Krestev, 3,780,548.

Glaxo Laboratories, Limited: *See—*
Davis, Benjamin; Pearce, Derek Roger; and Phillipps, Gordon Hanley, 3,781,435.
Phillipps, Gordon Hanley; and Turnbull, John Peter, 3,781,312.

Glenn, Francis: *See—*
Schack, Warren R.; and Glenn, Francis, 3,780,490.

Glew, Brian G., to Carriere Technical Industries, Ltd. Stroboscope with visual speed indicating system employing lights. 3,781,656, Cl. 324-16.00r.

Glover, Terence George: *See—*
Davis, Paul Trevor; Glover, Terence George; and Jones, John Robert, 3,781,195.

Glover, Warren E., to McKee, Arthur G., & Company. Furnace charging apparatus. 3,780,890, Cl. 214-36.000.

Gluchowicz, Gerszon, to AB UVA. Hudrostatic bearing. 3,781,069, Cl. 308-5.00r.

Gobron, Georges; and Pipon, Robert, to Melle-Benzons. Continuous process for conducting liquid phase chemical reactions. 3,781,373, Cl. 260-635.00c.

Godshalk, James B., to Fox Products Company. Method and apparatus for determining battery performance at one temperature when battery is at another temperature. 3,781,658, Cl. 324-29.500.

Godwin, Ernest. Heel enlarger. 3,780,454, Cl. 36-58.006.

Goldberg, Paul R., to Smith Kline Instruments, Inc. Fetal heartbeat monitoring system with plural transducers in one plane and at different angles thereto. 3,780,725, Cl. 128-2.05t.

Goldman, Lewis S.; Jeannotte, Dexter A.; and Krall, Bodgan, to International Business Machines Corporation. Quantitative test method for measuring solder-flux surface tension interaction. 3,780,568, Cl. 73-64.400.

Goldman, William A.: *See—*
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Golrick, Philip D.: *See—*
Botnick, Irlin; and Golrick, Philip D., 3,781,034.

Gonzalez, Jose Angel Fernandez-Colmeiro, to Fernandez-Colmeiro S.A. Dispenser housing for wire and the like. 3,780,964, Cl. 242-129.000.

Goode, George E.; Morgan, Barrie O.; and Branscome, Kenneth M., to Datotek, Inc. Digital data ciphering technique. 3,781,472, Cl. 178-22.000.

Goode, George E.; and Branscome, Kenneth M., to Detotek, Inc. Random digital code generator. 3,781,473, Cl. 178-22.000.

Goodyear Tire & Rubber Company, The: *See—*
Curtiss, Walter W., Jr., 3,780,783.
Dodson, Merritt E.; Marsh, Richard L.; and Masters, Frank C., 3,781,067.
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Gorbaty, Martin L.: *See—*
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Gordon, Gary B.: *See—*
Marshall, Howard D.; Gordon, Gary B.; Pipkin, Jesse E.; and Adler, Robin, 3,781,689.

Goroshkov, Boris Ivanovich; and Kovshov, Nikolai Ivanovich. Coherent analyzer of frequency-phase spectrum of electric signals. 3,781,568, Cl. 307-232.000.

Goubau, Georg J. E.: *See—*
Christian, Joseph Robert; Goubau, Georg J. E.; and Mink, James W., 3,781,546.

Goubeau, Robert: *See—*
Billarani, Patrick; Goubeau, Robert; and Langlois, Jacques, 3,780,479.

Gough, Geoffrey: *See—*
Maguire, Mary Helen; Gough, Geoffrey; and Michal, Frank, 3,781,274.

Goulton Industries, Inc.: *See—*
Shelly, Newton L., Jr., 3,781,759.

Gowdy, Harold W., to General Electric Company. Steam iron. 3,780,457, Cl. 38-77.081.

Grabijas, Sophie Mary. Adjustable mirror stand. 3,781,093, Cl. 350-288.000.

Graboyes, Harold: *See—*
Anderson, Elvin L.; and Graboyes, Harold, 3,781,358.

Grace, W. R., & Co.: *See—*
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Graco Inc.: *See—*
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Graff, Stuart L.: *See—*
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Graham, Dennis P.: *See—*
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Graham, John W. Tensiometer assembly for substitution type analytical balances. 3,780,569, Cl. 73-64.400.

Graham, John W.; and Rickey, Wynn P., to Esso Production Research Company. Gravel;packing method and composition. 3,780,807, Cl. 166-278.000.

Graham, Michael M., to Heyman Laboratory, The. Sedimentation measuring device. 3,781,118, Cl. 356-201.000.

Grainger, Robert B.: *See—*
Marco, Gino J.; and Grainger, Robert B., 3,781,440.

Granja, Louis Albert: *See—*
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Graphic Controls Corporation: *See—*
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Gray, Laverne E.: *See—*
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Gray Manufacturing Company, Inc.: *See—*
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Gray Tool Company: *See—*
Phipps, Willis M.; Holbert, Marvin L., Jr.; and McGee, John K., 3,780,802.

Grazen, Frank S.; Buike, Melvin E.; and Bryzinsky, Frank M., to Hooker Chemical Corporation. Friction particle for brake lining. 3,781,241, Cl. 260-38.000.

Greco, Carl C.; Mirviss, Stanley B.; and Martell, Arthur E., to Stauffer Chemical Company. Complex mixtures of N-benzyl-dihydronicotinic acid dimers and metal salts thereof and derivatives thereof. 3,781,296, Cl. 260-295.50r.

Green, Charles E.: *See—*
Lombardi, Louis J.; Coyne, Roy J.; and Green, Charles E., 3,781,275.

Green, Dale E. Ski carrier. 3,780,920, Cl. 224-49.000.

Green, William G. Viscous oil recovery system. 3,780,805, Cl. 166-266.000.

Gresho, William Milan, to Western Electric Company, Incorporated. Methods and compound gauge devices for measuring the axial curvature of a tube. 3,780,442, Cl. 33-178.00e.

Griebsch, Eugen: *See—*
Drawert, Manfred; and Griebsch, Eugen, 3,781,234.

Griest, Raymond H., to United States of America, Air Force. Liquid cooled mirror structure. 3,781,094, Cl. 350-310.000.

Grimm, Hugo: *See—*
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Grinchenko, Nikolai Grigorievich: *See—*
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich, 3,780,428.

Grom, Jury Ivanovich; and Yatsuk, Vladimir Grigorievich. Inverter. 3,781,645, Cl. 321-45.00c.

Groner, Warren; and George, Wilberdan Victor, to Technicon Instruments Corporation. Method and apparatus for analysis of leukocytes using light scattered by each leukocyte at absorbing and non-absorbing wavelength. 3,781,112, Cl. 356-39.000.

Gross, Richard A., to Mark Systems, Inc. Stabilized light beam projection system. 3,781,121, Cl. 356-247.000.

Grosshauser, Anton: *See—*
Lassig, Harry; and Grosshauser, Anton, 3,780,893.

Grover, Lawrence L.: *See—*
Nelson, Ronald C.; and Grover, Lawrence L., 3,781,631.

Groves, Ivor D., Jr., to United States of America, Navy. Piezoelectric transducer. 3,781,781, Cl. 340-9.000.

Grubbs, Conway E.; and Anderson, Dale R., to Chicago Bridge & Iron Company. Method of underwater welding using viewing scope. 3,781,512, Cl. 219-137.000.

Grunert, Kurt A., to Westinghouse Electric Corporation. Gas cooled electrical contactor. 3,781,500, Cl. 200-166.00k.

Grunert, Kurt A.; Dauer, John J., Jr.; and Dobrosielski, Stephen S., to Westinghouse Electric Corporation. Electric contactor. 3,781,728, Cl. 335-132.000.

GTE Automatic Electirc Laboratories, Incorporated: *See—*
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GTE Automatic Electric Laboratories, Incorporated: *See—*
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GTE Laboratories, Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
Gicca, Francis A.; Passavant, Francis C.; and Worters, Allen J., 3,781,850.
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Gueldner, Richard C.: *See—*
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Guglielmetti, Leonardo: *See—*
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Gulbins, Erich; Hauss, Alfred; Kieferle, Friedrich; and Kovacs, Jenoe, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Polymerization of vinyl and vinylidene compounds. 3,781,243, Cl. 260-87.50c.

Gulf Research & Development Company: *See—*
Bryson, Millard C.; McKinney, Joel D.; Titmus, Robert A.; and White, Frederick K., 3,781,197.
Cahoy, Roger P.; and Sanjean, John, 3,781,446.

Guthart, Leo A., to Alarm Device Manufacturing Company. Foil block device. 3,781,767, Cl. 339-125.00r.

Gutsogeorge, George Athan, to RCA Corporation. Voltage to pulse width converter. 3,781,870, Cl. 340-347.0ad.

Guy, Richard J. Log splitting device adapted to utilize powered piston on tractor. 3,780,779, Cl. 144-193.00a.

Guzynin, Ivan Georgievich: *See—*
Levina, Tatyana Abramovna; Serkh, Mikhail Borisovich; and Guzynin, Ivan Georgievich, 3,780,564.

H. N. Industries Inc.: *See—*
Zirlis, Joseph V., 3,780,867.

Haag, Jurgen: *See—*
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Haas, Joerg Philipp, to Bruker-Physik AG. Apparatus for adjusting magnet cores. 3,781,735, Cl. 335-298.000.

Hackstein, Karl-Gerhard; Kadner, Martin; and Forster, Horst, to NUKEM, Nuklear-Chemie und- Metallurgie Gesellschaft mit beschrankter Haftung. Process for the production of oxide and carbide containing nuclear fuel particles for high temperature reactors. 3781,216, Cl. 252-301.10r.

Hadnot, Leroy. Device for holding fishing rods. 3,780,466, Cl. 43-17.000.

Haede, Werner; Stache, Ulrich; Fritsch, Werner; Radscheit, Kurt; and Lindner, Ernst, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 2,3-Alkylidene-rhamnopyranosides and process for preparing them. 3,781,269, Cl. 260-210.500.

Haefele, Louis R.: *See—*
Ezzell, Bobby R.; Fluck, Eugene R.; and Haefele, Louis R., 3,781,444.

Hagen, Thomas E., to Zipser, Frederick S., M.D. Variable rate measuring device. 3,781,677, Cl. 324-78.00r.

Hagmann, Foster M. Multiple pipe joint seal. 3,781,043, Cl. 285-363.000.

Hahn & Clay: *See—*
Pechachek, Raymond E., 3,780,901.

Haigh, Curzon John: *See—*
Allan, Robert William; Haigh, Curzon John; and Hamdorf, John, 3,781,405.

Haike, Fred Louis, to Hoffmann-La Roche Inc. Heartbeat rate monitoring. 3,780,726, Cl. 128-2.05t.

Hajdu, Johann: *See—*
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Halasa, Adel F., to Firestone Tire & Rubber Company, The. Process for metalation. 3,781,260, Cl. 260-94.70a.

Halasa, Adel F., to Firestone Tire & Rubber Company, The. Metalating rubber polymers. 3,781,261, Cl. 260-94.700.

Halasa, Adel F.; and Stayer, Mark L., to Firestone Tire & Rubber Company, The. Process for metalation. 3,781,262, Cl. 260-94.70a.

Halasa, Adel F.; and Mitchell, George B., to Firestone Tire & Rubber Company, The. Process for metalation. 3,781,263, Cl. 260-94.70a.

Halberg, Richard A.: *See—*
Balthazar, Real J.; and Halberg, Richard A., 3,780,555.

Hall, Lewis D., to Veeco Instruments, Inc. Sputter ion pumps. 3,781,133, Cl. 417-49.000.

Halsey Harbester & Supply Co., Inc.: *See—*
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Hamada, Satoshi: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.

Hamdorf, John: *See—*
Allan, Robert William; Haigh, Curzon John; and Hamdorf, John, 3,781,405.

Hamm, John G., III: *See—*
Tsilibes, George N.; D'Amico, Frank V.; and Hamm, John G., III, 3,781,516.

Hammond, Peter W.: *See—*
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Hanazono, Masanobu; and Asai, Osamu, to Hitachi, Ltd. Magnetic head having a combination core formed from a pretreated magnetic layer. 3,781,476, Cl. 179-100.20c.

Hancovsky, John P., to Hi-Ho Products, Inc. Sectional creative toy. 3,780,469, Cl. 46-25.000.

Handte, Heinz: *See—*
Sennewald, Kurt; Erpenbach, Heinz; Handte, Heinz; Kohl, Georg; and Lork, Winfried, 3,781,193.

Hanes, James Gordon, Jr.; King, James Frank; Lathery, Willie M.; Beamon, Howard L.; and Newlen, Kenneth W. Apparatus for producing endless bands. 3,780,679, Cl. 112-121.270.

Hanggi, Peter; and Budmiger, Hermann. Process including the bristles for the production of brushes or a part thereof. 3,781,402, Cl. 264-243.000.

Hanning Elektro-Werke, Robert Hanning, Firma: *See—*
Neumann, Gernot, 3,781,623.

Hansch, Theodor W.; and Varsanyi, Frank L., to Leland Stanford Junior University, The Board of Trustees of the. Optical element system and method for amplifying image forming light rays. 3,781,700, Cl. 330-4.300.

Hansen, Ove Emil, to Aktieselskabet Niro Atomizer. Cleansing device for powder processing apparatuses. 3,780,445, Cl. 34-57.00d.

Hanson, Wallace E., to Champion International Corporation. Compartmented display container. 3,780,931, Cl. 229-27.000.

Hansson, Margaret S., to Gerico, Inc. Infant carrier. 3,780,919, Cl. 224-6.000.

Hara, Kouichi: *See*—
Nonaka, Shunsuke; Yuuki, Tasuku; and Hara, Kouichi, 3,781,577.

Hara, Tadao: *See*—
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Harada, Kazuhiko: *See*—
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Harbeck, Martin B.; and Lagerstrom, Robert C., to Singer Company, The. Wet/dry suction cleaner. 3,780,397, Cl. 15-413.000.

Hardt, David R.: *See*—
Abler, Norman C.; and Hardt, David R., 3,780,670.

Hardy, William C.; and Lichte, Henry P., Jr., to Sun Oil Company (Delaware). Downhole control valve for catalytic wellbore heaters. 3,780,803, Cl. 166-59.000.

Hargraves, William J., to Bertran & Hargraves, Inc. Aerobic sewage treatment. 3,780,997, Cl. 261-77.000.

Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. Solid state induction cooking appliances and circuits. 3,781,503, Cl. 219-10.490.

Harnden, John D., Jr., to General Electric Company. Induction cooking appliance including temperature sensing of inductively heated cooking vessel by radiation detection means. 3,781,504, Cl. 219-10.490.

Harnessed Energies, Inc.: *See*—
Lewis, John R., 3,781,858.

Harnstone, Leonard A.; Levy, Robert E.; Morris, Stanley M.; Lopez, Alfredo M.; Mosler, Henry A.; and Bartman, Robert V., to Esso Research and Engineering Company. Constraint control system for optimizing performance of process units. 3,781,533, Cl. 235-150100.

Harp, Harry J., to Union Carbide Corporation. Method and apparatus for producing a gang of separably interconnected elongate articles. 3,780,921, Cl. 225-2.000.

Harries, Gwyn: *See*—
Harrison, Paul Stanley; and Harries, Gwyn, 3,781,180.

Harris, Leroy S., to K-G Industries, Inc. Apparatus for agglomerating particulate material. 3,781,151, Cl. 425-145.000.

Harrison, Anthony William, to Girling Limited. Disc brakes for vehicles. 3,780,835, Cl. 188-74.000.

Harrison, Ian Robert; McCarthy, John Felix; and Palmer, Bryan Harper, to Boots Pure Drug Company Limited. Pesticidal compounds and compositions. 3,781,355, Cl. 260-564.00r.

Harrison, Paul Stanley; and Harries, Gwyn, to Imperial Chemical Industries of Australia and New Zealand Limited. Ammonium nitrate-fuel oil composition containing ammonium nitrate prills of different porosity, hardness, and density. 3,781,180, Cl. 149-21.00.

Harrison, Reginald, to Dunlop Limited. Elastomerically spring railway truck bolster. 3,780,671, Cl. 105-197.00a.

Harrison, William L.; Purington, Ronald G.; and Anderson, Donald L., to Sanders Associates. Bed guard system. 3,781,843, Cl. 340-279.000.

Harrold, William J., to Raytheon Company. Radial magnetized magnet. 3,781,592, Cl. 315-39.710.

Hart, Charles H.; and Cashaw, George R., to American Newspaper Publishers Association and Research Institute, Incorporated. Method for separating plural sheets. 3,781,006, Cl. 271-18.00r.

Hartley, Kenneth Alison: *See*—
Maidens, John Eric; Hartley, Kenneth Alison; and Carrotte, Frederick Henry, 3,780,540.

Hartzler, Harris Dale, to Du Pont de Nemours, E. I., and Company. 2-Arylidene-1,3-dithioles and preparation thereof from acetylenes, carbon disulfide, and aromatic aldehydes in the presence of aliphatic phosphines. 3,781,281, Cl. 260-240.00f.

Harwood, Channing E. Harwood retainer. 3,781,761, Cl. 339-75.00p.

Harwood, Robert George, to AMP Incorporated. Coated ferrite filters having stamped and formed outer sleeves. 3,781,723, Cl. 333-79.000.

Haseloff, Fritz. Lawn mower. 3,780,504, Cl. 56-13.600.

Hashiue, Masakazu: *See*—
Murakoshi, Makoto; Ooue, Shingo; Ueda, Hiroyuki; Hashiue, Masakazu; and Endo, Hirotoshi, 3,781,809.

Hassencahl, Lloyd J., to United States of America, Air Force. Moving range gate generating system for radar apparatus. 3,781,885, Cl. 343-7.300.

Hastings Manufacturing Company: *See*—
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Quinlan, William J.; and Hover, Lawrence L., 3,780,395.

Hathaway, Richard A.: *See*—
Swain, William W.; and Hathaway, Richard A., 3,781,487.

Haugen, Sverre R. Closure for multiple passage conduit. 3,780,773, Cl. 138-89.000.

Hauss, Alfred: *See*—
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Havas, Richard J.: *See*—
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Hawker Siddeley Canada Ltd.: *See*—
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Hawkins, Jerry F., to General Motors Corporation. Fluid vaporization tester. 3,780,565, Cl. 73-17.00a.

Hawthorne, John Q.; and Schlosberg, Samuel B., to United States Steel Corporation. Process for preparing formamide in the presence of oxygen. 3,781,352, Cl. 260-561.00r.

Hayden, Rodney, to TRW Inc. Inverted low loss relay structure. 3,781,729, Cl. 335-187.000.

Haydo, Andrew G., to Westinghouse Air Brake Company. Single cylinder truck-mounted brake. 3,780,837, Cl. 188-195.000.

Hayes, Thomas H., to V.C.A. Corporation. Combination vanity tray and mirror. 3,780,746, Cl. 132-83.00r.

Haynes, Jerry L., to Veeder Industries Inc. Material feed rate control system. 3,780,541, Cl. 66-125.00r.

Hazzard, Noel D.; and Anderson, William M., to Air Preheater Company, Inc., The. Metallic recovery system. 3,780,676, Cl. 110-8.00a.

Heath Company: *See*—
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Hehmiz, Ramiz Y.: *See*—
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Heide, Charles H.: *See*—
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Heidel, Rodney L., to Meridian Industries, Inc. Protective control circuit for vehicle electrical systems. 3,781,651, Cl. 322-8.000.

Heiler, Paul S.: *See*—
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Heim, Joseph R., to United States of America, Atomic Energy Commission. Low heat conductant temperature stabilized structural support. 3,781,733, Cl. 335-216.000.

Heiniger, Wilfred; and Lepinay, Gerard, to Bolex International SA. Control apparatus for varying focal length of cinematographic zoom lens. 3,781,098, Cl. 352-140.000.

Heinrich Koppers Gesellschaft mit beschrankter Haftung: *See*—
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Heitmann, Knut: *See*—
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Helgerud, Robert J.; and Simon, Ernest M., to K-P Manufacturing Co., Inc. Cartridge-type grease guns. 3,780,830, Cl. 184-105.00a.

Helgstrand, John Erik: *See*—
Carlsson, Lars Anders Fritz; Helgstrand, John Erik; Sjoberg, Berndt Olof Harald; and Stjernstrom, Nils Erik, 3,781,280.

Helm, Joan K., to Textron, Inc. Aqueous chain extension of NCO prepolymer with tertiary amino polyol using nonionic surfactant, and aqueous dispersion produced. 3,781,238, Cl. 260-29.2tr.

Hendel, Robert J.: *See*—
Almasi, George S.; Hendel, Robert J.; and Keefe, George E., 3,781,832.

Henderson, Raymond G.; and Hess, Ervin A., to G-T-O Inc. Washing machine and door structure therefor. 3,780,545, Cl. 68-210.000.

Henle, Robert A.; Ho, Irving T.; Jen, Teh-Sen; and Maley, Gerald A., to International Business Machines Corporation. Monolithic array error detection system. 3,781,793, Cl. 340-146.1ag.

Henmi, Nobor; and Kumagai, Hiromi. D.C. discharge gas laser with novel discharge tube. 3,781,708, Cl. 331-94.500.

Hennart, Claude; Moldovanyi, Laszlo; and Roth, Willy, to Ciba-Geigy AG. Hydrophobic insecticidal compositions. 3,781,428, Cl. 424-219.000.

Henrick, Clive A.; and Siddall, John B. Halohydrin thiol dienoates. 3,781,322, Cl. 260-455.00r.

Henry, Wesley D., to Essex International, Inc. Thermal circuit protector. 3,781,737, Cl. 335-407.000.

Herb, Eugen, to Trumpf & Co., Firma. Setting device for the stroke position of a reciprocating tool. 3,780,814, Cl. 173-2.000.

Herbert, Denys; and Martens, Ernst, to Spiroll Corporation Ltd. Device for forming shear keyways on sides of extruded slabs and the like. 3,781,154, Cl. 425-329.000.

Herman, Stanley W., to General Motors Corporation. Friction welder and friction welding methods. 3,780,422, Cl. 29-470.003.

Hermans, Albert L. Controlled wave pattern ultrasonic burglar alarm. 3,781,859, Cl. 340-258.00a.

Hermes, Mathew Edward, to Du Pont de Nemours, E. I., and Company. Alkoxy silyl alkyl compounds and polymers thereof. 3,781,251, Cl. 260-80.710.

Herolzer, Ralph H., to Vanguard Industries Inc. 90° Stackable and nestable tray. 3,780,905, Cl. 220-97.00d.

Herrell, Arthur D., to Dow Chemical Company, The. Closure for film packages and method of making same. 3,780,488, Cl. 53-38.000.

Herrmann, Pierre, to Compteurs Schlumberger. Infrared absorption analysis method and apparatus for determining gas concentration. 3,781,910, Cl. 250-341.000.

Herzog, Hershel L.: *See*—
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Hesener, Walter. Question and answer educational game with an answer control device. 3,780,453, Cl. 35-48.00r.

Hess, Ervin A.: *See*—
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Hester, Jackson B., Jr., to Upjohn Company, The. 7-Chloro-1-methyl-5-phenyl-s-triazolo-(4,3-a) quinolines. 3,781,289, Cl. 260-288.00r.

Hewlett-Packard Company: *See*—
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Marshall, Howard D.; Gordon, Gary B.; Pipkin, Jesse E.; and Adler, Robin, 3,781,689.
Simcoe, Kent W., 3,781,654.
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Sabina, William E., 3,781,734.
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Hicks, Manuel Grant. Fluorocarbon and oxygen-providing compound treatment of waste waters. 3,781,200, Cl. 210-21.000.
Hicks, Tommie Earl; and Amestoy, Lavern John. Disposable liner for coffee filter basket. 3,780,871, Cl. 210-471.000.
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Hilbert, Francis H.: *See*—
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Hildebrand, Willi: *See*—
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Himmele, Walter; Fliege, Werner; and Forehlich, Helmut, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Eliminating carbon dioxide from formyl-oxyalkynes. 3,781,337, Cl. 260-491.000.
Hims, Inc.: *See*—
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Hinkle, Joseph D., to Dam Fine Products Corporation. Refrigerator door shock absorber. 3,781,046, Cl. 292-264.000.
Hinks, William L., to Goodyear Tire & Rubber Company, The. Mechanical reading of tire identification symbols. 3,781,798, Cl. 340-146.30r.
Hinsperger, Cornelius Andre. Fastener for flexible sheet material. 3,780,400, Cl. 24-16.0pb.
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Hipotronics, Inc.: *See*—
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Hirs, Gene, to Hydromation Filter Company. Granular filter medium. 3,780,861, Cl. 210-80.000.
Hirschfelder, Horst-Dieter, to Fried, Krupp Gesellschaft mit beschrankter Haftung. Wire-looping apparatus. 3,780,963, Cl. 242-82.000.
Hitachi, Ltd.: *See*—
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Hanazono, Masanobu; and Asai, Osamu, 3,781,476.
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Hobart Manufacturing Company, The, mesne: *See*—
Miller, Blaine Monroe, Jr.; Buckman, Wayne T.; and Warner, Ellis R., Jr., 3,780,956.
Hoehl, Bernhard; and Kummerer, Karl-Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus and method for arranging flat articles on a trough conveyor. 3,780,849, Cl. 198-30.000.
Hoerner-Waldorf Corporation: *See*—
McLaren, Edwin C.; and Lund, Raymond, 3,780,932.
Hoffberger, Charles C., II; and Rivlin, Charles A. Television screen light shield. 3,781,471, Cl. 178-7.820.
Hoffecker, James L. Metal working brush assembly. 3,780,407, Cl. 29-90.000.
Hoffman, Erwin, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Material transfer aparatus for a rotary drum. 3,780,888, Cl. 214-18.00k.
Hoffman, William C.: *See*—
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Hoffmann, Thomas C., to Adams Company, The. Foundry flask. 3,780,790, Cl. 164-392.000.
Hoffmann-La Roche Inc.: *See*—
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Holberg, Dieter E., to Hughes Aircraft Company. Adaptive digital automatic gain control for MTI radar systems. 3,781,882, Cl. 343-7.00a.
Holbert, Marvin L., Jr.: *See*—
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Hole, William L. Method for preparing pineapple. 3,780,641, Cl. 426-482.000.
Holley, George M., Jr. Position plotter. 3,781,892, Cl. 343-112.0pt.
Holley, John D.; and Peppin, Richard A., to Mannix Construction, Inc. Machine for inserting ties beneath a railroad track. 3,780,664, Cl. 104-9.000.
Hollier, Joseph H., Jr., to Sutco, Inc. Device for thinning cellulosic strips. 3,780,626, Cl. 93-1.00g.
Holloway, Albert L. Spiral antenna with dielectric cover. 3,781,898, Cl. 343-872.000.
Holmberg, Bengt Roland: *See*—
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Holmes, Fred M.: *See*—
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Holmes, James C.; and Holmes, Fred M. Trailer. 3,780,894, Cl. 214-505.000.
Holzgruber, Wolfgang; Machner, Peter; Schneihofer, Adolf; Kleinhagauer, Otmar; and Cerwenka, Peter, to Gebr. Bohler & Co. AG. Electric slag refining process and apparatus. 3,781,448, Cl. 13-12.000.
Holzman, Richard: *See*—
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Honeywell Inc.: *See*—
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Hopkins, Richard H.; Roland, George W.; Steinbruegge, Kenneth B.; and Partlow, William D., to Westinghouse Electric Corporation. Calcium containing silicate oxyapatite lasers. 3,781,707, Cl. 331-94.500.
Horak, Vladimir; and Vretener, John. Automatic tank plug valve. 3,780,981, Cl. 251-144.000.
Horn, John J., to Tektronix, Inc. Phase control system for signal conditioning circuits. 3,781,470, Cl. 178-7.30r.
Horn, Robert F., to Eastman Kodak Company. Photographic material processing apparatus. 3,780,637, Cl. 95-93.000.
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Horres, Eugene S. Eye contact lens manipulator. 3,781,050, Cl. 294-1.0cd.
Horton, Billy M. Fuze having a high resistance to countermeasures. 3,781,884, Cl. 343-7.0pf.
Horton, Edward E., to Deep Oil Technology Inc. Tension leg offshore marine apparatus. 3,780,685, Cl. 114-.50d.
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Houghton, Norman F., to Philco-Ford Corporation. Method for forming articles from plastic sheet material. 3,781,394, Cl. 264-89.000.

Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz-Warner, Inc. Substituted methano dibenzazocines and dibenzazonines. 3,781,270, Cl. 260-239.0db.

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Quinlan, William J.; and Hover, Lawrence L., 3,780,395.

Hovey, John M., to United States of America, Navy. Beacon target selector and evaluator. 3,781,881, Cl. 343-6.50r.

Howe, John Arthur, to TRW Inc. Lampholder. 3,781,768, Cl. 339-125.000.

Hoyt, Ronald F.: *See—*
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Hsieh, Henry L., to Phillips Petroleum Company. Polymerization of acenaphthylene and indene. 3,781,259, Cl. 260-93.50c.

Huang, David H., to United States of America, Air Force. Composite wall for a regeneratively cooled thrust chamber of a liquid propellant rocket engine. 3,780,533, Cl. 60-260.000.

Huang, David H., to United States of America, Air Force. Tension brazed face injector. 3,780,952, Cl. 239-424.5C0.

Hubbell, Franklin R., III, to Tenneco In. Gas silencing structure. 3,780,826, Cl. 181-36.00b.

Huber, Charles J., to Westinghouse Electric Corporation. Analog-to-digital converter. 3,781,868, Cl. 340-347.00p.

Huber, Wolfgang, to Diagnostic Data, Inc. Orgotein-polystyrene latex diagnostic for rheumatoid factor. 3,781,414, Cl. 424-12.000.

Hubert, Lucien: *See—*
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Hubler, Lawrence C.: *See—*
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Hughes, James S., Jr., to Trident Engineering Co. Load resistance change alarm. 3,781,841, Cl. 340-251.000.

Hughes, Nathaniel, to United States of America, Army. Fluid ionization. 3,780,945, Cl. 239-102.000.

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Hungerford, Daniel Comstock, to Brunswick Corporation. Anchor having improved fluke crown coupling. 3,780,688, Cl. 114-208.000.

Hurley, Thomas J.; and Robinson, Martin A., to Olin Corporation. Preparation of aromatic isocyanates. 3,781,321, Cl. 260-453.0pc.

Hurst, Alvin L., to Aluminum Company of America. Method of fabricating composite multi-metallic billets useful for metal working operations. 3,780,418, Cl. 29-420.000.

Hurt, John M., Jr. Index card filing system. 3,780,460, Cl. 40-78.000.

Huskins, Chester W.; and Thomas, Albert J., Jr. Composite propellants with a difunctional ballistic modifier-curing agent. 3,781,179, Cl. 149-19.200.

Hydromation Filter Company: *See—*
Hirs, Gene, 3,780,861.

Hydrotech Services, Inc.: *See—*
White, William E., Jr.; and Billingsly, Lloyd E., 3,780,421.

Hyster Company: *See—*
Schwab, Delmar G.; and Graham, Dennis P., 3,780,820.

I-T-E Imperial Corporation: *See—*
DiMarco, Bernard; Kussy, Frank W.; and Swain, Kenneth W. (said DiMarco and said Kussy assors. to), 3,781,607.

Ichimoto, Yoshiharu: *See—*
Miyajima, Tohru; Ichimoto, Yoshiharu; and Saeki, Arinori, 3,781,625.

Ideal Aerosmith, Inc., mesne: *See—*
Taylor, James L., 3,780,440.

Identicon Corporation, mesne: *See—*
Hug, Hans A.; and Jone, Paul W., 3,781,079.

Identification Systems, Inc.: *See—*
Killen, Donald E., 3,781,855.

Ikazaki, Koh: *See—*
Izawa, Nobuharu; Toyoshima, Hiroshi; and Ikazaki, Koh, 3,780,405.

Ikeda, Toshimitu: *See—*
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 3,781,208.

Iles, Gerald Sidney; and Selman, Gordon Leslie, to Johnson, Matthey & Co., Limited. Resistance thermometer element. 3,781,749, Cl. 338-25.000.

Image Analysing Computers Limited: *See—*
Soames, Michael Richard, 3,781,467.

Imperial Chemical Industries, Limited: *See—*
Birchall, James Derek; Cassidy, John Edward; and Smith, Frank, 3,781,239.
Waters, Graham Thomas, 3,780,515.

Imperial Chemical Industries of Australia and New Zealand Limited: *See—*
Harrison, Paul Stanley; and Harries, Gwyn, 3,781,180.

Imris, Pavel, to Ecotrol, Inc. Optical generator of an electrostatic field having longitudinal oscillation at light frequencies for use in an electrical circuit. 3,781,601, Cl. 315-227.000.

Inaba, Shigeho: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Akatsu, Mitsuihiro; Maruyama, Isamo; and Izumi, Takahiro, 3,781,299.

Industrial Science & Technology, Agency of: *See—*
Takamatsu, Hideaki; Murashima, Noboru; and Nishihira, Koichi, 3,781,185.

Industrial Science and Technology, Agency of: *See—*
Suzuki, Horoshi; and Tsutsui, Yoshiro, 3,781,218.

Inoue, Hiromitsu; Okamoto, Shinsuke; Mori, Hirokazu; and Ohasi, Hirosi, to Matsushita Electric Works, Ltd. Ultrasonic detection apparatus. 3,781,772, Cl. 340-1.00r.

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I.N.R.S.: *See—*
Darmon, Michel, 3,781,493.

Inservco, Inc.: *See—*
Sudnick, Dennis J.; and Shutts, Robert L., 3,781,869.

Insierman, Hans E., to United States of America, Army. Single-antenna repeater system utilizing hybrid transformers. 3,781,684, Cl. 325-5.000.

Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
Alagy, Jacob; and Busson, Christian, 3,781,344.
Delignieres, Robert, 3,781,774.

Institut Francois du Petrole des Carburants et Lubrifiants: *See—*
Desbrandes, Robert, 3,781,784.

Intec Corporation: *See—*
Baker, Cole H., 3,781,531.

International Business Machines Corporation: *See—*
Ahearn, Thomas P.; Capowski, Robert S.; Christensen, Neal T.; Gannon, Patrick M.; Lee, Arlin E.; and Liptay, John S., 3,781,808.
Alexander, Arthur Duane, 3,781,851.
Almasi, George S.; Hendel, Robert J.; and Keefe, George E., 3,781,832.
Baker, Thoedore H.; Ghafghaichi, Majid; and Totta, Paul A., 3,781,609.
Baldwin, Douglas S.; Benton, Kenneth E.; and Jacques, Vincent L., 3,781,017.
Beausoleil, William Francis, 3,781,826.
Benton, Kenneth E.; and Jacques, Vincent L., 3,781,016.
Boudreau, Paul E.; Dixon, Roy C.; Donnan, Robert A.; and Moss, Eual A., 3,781,815.
Ellul, Joseph M., 3,781,845.
Freed, Larry E., 3,781,683.
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Henle, Robert A.; Ho, Irving T.; Jen, Teh-Sen; and Maley, Gerald A., 3,781,793.
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Meier, Johann Hans, 3,780,650.
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Phillips, William B., 3,781,490.
Platt, Steven; and Pomeranz, Jehoshua N., 3,781,828.
Robinson, Thomas Scott, 3,781,799.
Roth, Robert Ingersoll, 3,781,821.
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International Harvester Company: *See—*
Deli, Jack M.; and Hehmiz, Ramiz Y., 3,781,066.
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International Minerals & Chemical Corporation: *See—*
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International Playtex Corporation: *See—*
Cole, Raymond C., 3,780,741.
Fitzpatrick, William E.; Berger, Leonard; and Auerbach, Hayward B., 3,780,908.

International Standard Electric Corporation: *See—*

Cragg, William D.; Bradshaw, Leslie E. B.; Batchelor, Anthony C.; and Carter, Ronald D., 3,781,492.
Cramer, Bernhard; Domig, Herbert; Von Keller, Theodor; and Schmeykal, Rudolf, 3,781,800.
Lord, Michael Robert, 3,781,571.
International Synthetic Rubber Company: *See—*
Bassham, Kenneth John; and Feast, Alan Arthur John, 3,781,236.
International Telephone and Telegraph Corporation: *See—*
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Iowa University of Iowa, State of: *See—*
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Iqbal, Abul F. M.: *See—*
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Irving, Edgar W., Jr., to Egan Machinery Company. Material feeding apparatus. 3,780,801, Cl. 165-120.000.
Irwin, Carl F., to Du Pont de Nemours, E. I., and Company. Process for manufacture of organic isocyanates. 3,781,320, Cl. 260-453.0ph.
Isaev, Alexei Ilich: *See—*
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich, 3,780,428.
Ishida, Yoshio, to Diamond Electric Manufacturing Co., Ltd. High voltage pulse generating apparatus. 3,781,649, Cl. 323-19.000.
Ishihama, Masaru: *See—*
Iwaki, Katsutaro; Mori, Kazumasa; Ishihama, Masaru; and Kobayashi, Yukio, 3,781,633.
Itabashi, Yoshio; Saito, Susumu; and Seki, Masao, to Kanebo, Ltd. Titanium hydride catalyzed polyester polycondensation. 3,781,245, Cl. 260-75.00r.
Italfarmaco S.p.A.: *See—*
Zoni, Giorgio, 3,781,439.
Itek Corporation: *See—*
Bauman, Weldon W.; and Collins, Edward, IV, 3,781,691.
Bechtold, Edwin W., 3,781,097.
Ford, Peter W., 3,781,693.
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Ito, Isao: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.
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Iwaisako, Toshiyuki: *See—*
Kominami, Naoya; Iwaisako, Toshiyuki; and Ohki, Kusuo, 3,781,221.
Iwaki, Katsutaro; Mori, Kazumasa; Ishihama, Masaru; and Kobayashi, Yukio, to Nippondenso Co., Ltd. Vehicle-carried storage battery charging device. 3,781,633, Cl. 320-48.000.
Izawa, Nobuharu; Toyoshima, Hiroshi; and Ikazaki, Koh, to Teijin Limited. Apparatus for supplying crimped synthetic filament tow to conveyor for heat treatment. 3,780,405, Cl. 28-1.600.
Izawa, Shinichi; Toyama, Kunio; Harada, Kazuhiko; and Sugawara, Yoshiaki, to Asahi-Dow Limited. Thermoplastic resin mixture and process for producing the same. 3,781,382, Cl. 260-874.000.
Izuhara, Seiji: *See—*
Aoki, Katsuo; Yatani, Kozo; Kometani, Eishi; and Izuhara, Seiji, 3,781,423.
Izumi, Takahiro: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Akatsu, Mitsuihiro; Maruyama, Isamo; and Izumi, Takahiro, 3,781,299.
Izumi, Zenji: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.
Jablansky, Louis, to United States of America, Navy. In-line explosion arrester. 3,780,753, Cl. 137-68.000.
Jac, Inc.: *See—*
Anderson, Thomas W.; and Caroon, Robert L., 3,781,837.
Jackson, Bryon, Inc.: *See—*
Barron, Charles Dwain; Geczy, Bela; and Wilms, Carl Alfred, 3,780,815.
Jackson, Edward J., to Westinghouse Electric Corporation. Digital phase-locked-loop. 3,781,695, Cl. 328-155.000.
Jackson, William D., said Jackson and Bell assors. of 10% each to Rankin, R. Ray. Method for mounting and preserving animals without evisceration. 3,780,452, Cl. 35-20.000.
Jacobs, James W., to General Motors Corporation. Cam operated compressor. 3,781,144, Cl. 417-525.000.
Jacobs, Thomas A., to Tideland Signal Corporation. Navigational light system. 3,781,853, Cl. 340-29.000.
Jacobsen Manufacturing Company: *See—*
Woelffer, Neill C., 3,780,509.
Jacobson, Oscar D. Combination centrifugal and viscous shear rotary pump. 3,781,136, Cl. 417-353.000.
Jacobson, Robert S., to Sperry Rand Corporation. Area navigation system. 3,781,880, Cl. 343-6.00r.
Jacoby, Ian H.: *See—*
Lukacs, Michel J.; and Jacoby, Ian H., 3,780,935.
Jacoby, Joseph M.: *See—*
Jacoby, Joseph M.; and Gelak, Richard (said Gelak assor. to said), 3,780,458.
Jacoby, Joseph M.; and Gelak, Richard, said Gelak assor. to said Jacoby, Joseph M. Portable visual-aid or display device. 3,780,458, Cl. 40-31.000.
Jacques, Vincent L.: *See—*
Baldwin, Douglas S.; Benton, Kenneth E.; and Jacques, Vincent L., 3,781,017.
Benton, Kenneth E.; and Jacques, Vincent L., 3,781,016.
Jahnel, Benno: *See—*
Batsch, Helmut; Jahnel, Benno; Weinz, Ernst August; Berger, Wolfgang; and Dickopp, Gerhard, 3,781,020.
Jancis, Elmar H., to Uniroyal, Inc. Polymeric phenolic phosphorous acid ester amides. 3,781,385, Cl. 260-930.000.
Janssen, Edward W.; and Kyle, Robert C., to Minnesota Mining and Manufacturing Company. Physically reinforced hydrophilic foam and method of preparing same. 3,781,231, Cl. 260-2.5be.
Jaques, Roland; and Rossi, Alberto, to Ciba-Geigy Corporation. Oesters of monosacchairdes having ether groupings. 3,781,267, Cl. 260-210.00r.
Jasper, Louis J., Jr., to United States of America, Army. TWT with stacked spiral-pairs slow-wave circuit. 3,781,702, Cl. 330-43.000.
Jeannotte, Dexter A.: *See—*
Goldman, Lewis S.; Jeannotte, Dexter A.; and Krall, Bodgan, 3,780,568.
Jeffers, Frederick J.; and Rolker, John H., to Bell & Howell Company. Magnetic imaging methods and media. 3,781,903, Cl. 346-74.0mp.
Jeger, Oskar: *See—*
Wehrli, Hansuli; and Jeger, Oskar, 3,781,271.
Jen, Teh-Sen: *See—*
Henle, Robert A.; Ho, Irving T.; Jen, Teh-Sen; and Maley, Gerald A., 3,781,793.
Jenkins, Gerald L.; Jungjohann, Vernon H.; and Marvin, Edgar S., to Eastman Kodak Company. Motion picture camera drive mechanism. 3,781,100, Cl. 352-180.000.
Jenkins, Robert; Mead, Carver A.; and McCaldin, James, to Monsanto Company, mesne. Ohmic contact to zinc sulfide devices. 3,780,427, Cl. 29-590.000.
Jenkner, Herbert; and Konigstein, Otto, to Chemische Fabrik Kalk GmbH. Phosphates. 3,781,388, Cl. 260-953.000.
Jenne, Helmut: *See—*
Stange, Karl; Jenne, Helmut; and Koenig, Ulrich, 3,781,186.
Jennings, Alan K., to Pertec Corporation, mesne. Keyboard entry system. 3,781,874, Cl. 340-365.00s.
Jennings, George L.; and Nichols, Parks M., to Uniroyal, Inc. Tire with belt between bias carcass plies. 3,780,782, Cl. 152-356.000.
Jensen, Hans A.; and Layman, Melvin M., to Mayer, Oscar, & Co., Inc. Method of packaging. 3,780,486, Cl. 53-14.000.
Jentsch, Alfred C., Jr.; Taylor, Edward I., Jr.; and Shukoff, Walter, to USM Corporation of Flemington, N.J. Hot log shear. 3,780,606, Cl. 83-23.000.
Jernakoff, George: *See—*
Roberts, Richard W.; and Jernakoff, George, 3,781,840.
Jerrold Electronics Corporation: *See—*
Duty, George Otto, 3,781,703.
Jessee, Ralph D., to Westinghouse Electric Corporation. Integrated error voltage regulator for static switching circuits. 3,781,634, Cl. 321-9.00a.
Jinbo, William, to GTE Automatic Electric Laboratories, Incorporated. Code processor output buffer verify check. 3,781,797, Cl. 340-146.10r.
Jobst, Raymond C.: *See—*
Perry, William A.; and Jobst, Raymond C., 3,780,880.
Joeckel, Stanley V., to Lincoln Manufacturing Company, Inc. Metal clad hairpin shaped electric interleaved heating elements. 3,781,525, Cl. 219-532.000.
Johannesson, Nils Olof, to Telefonaktiebolaget L M Ericsson. Picture telephone system at which the video signal is adapted to the character of the picture. 3,781,477, Cl. 179-2.0tv.
Johanningmeier, Charles E., to International Minerals & Chemical Corporation. Method and apparatus for controlling dust. 3,780,495, Cl. 55-1.000.
John, Erwin Roy, to Neuro-Data, Inc. Sensation-cognition computer employing "t" test calculations. 3,780,724, Cl. 128-2.10b.
Johns Hopkins University, The: *See—*
Pardoe, Carroll T.; Carlton, Alvar G.; and Appel, Robert L., 3,781,818.
Johnson, Douglas, to General Motors Corporation. Combustion apparatus. 3,780,529, Cl. 60-39.360.
Johnson, Ernest H., to Andrew Corporation. Tube corrugating apparatus and method. 3,780,556, Cl. 72-78.000.
Johnson, Frederick W., to Collin's Radio Company. Moisture seal for electrical connector. 3,781,764, Cl. 339-94.000.
Johnson, Marvin F. L.; and Graff, Stuart L., to Atlantic Richfield Company. Halide addition and distribution in the reactivation of platinum-rhenium catalysts. 3,781,219, Cl. 252-415.000.
Johnson, Matthey & Co., Limited: *See—*
Iles, Gerald Sidney; and Selman, Gordon Leslie, 3,781,749.
Johnson, Peter D., to General Electric Company. Long lifetime mercury-metal halide discharge lamps. 3,781,586, Cl. 313-174.000.
Johnson, Robert C.: *See—*
Neel, Robert M.; and Johnson, Robert C., 3,780,744.
Johnson, Robert Wayne: *See—*
Caleskie, Vincent J.; Hughes, Paul T.; and Johnson, Robert Wayne, 3,781,789.

Johnson, Theodore F.: *See—*
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Jolly, Jean: *See—*
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Jolly, Michael D.: *See—*
Peyton, Keith S.; and Jolly, Michael D., 3,780,615.

Jone, Paul W.: *See—*
Hug, Hans A.; and Jone, Paul W., 3,781,079.

Jones, Alan Richardson, to Coulter Chemistry, Inc., mesne. Colorimeter with automatic cuvette. 3,781,116, Cl. 356-180.000.

Jones, Cecil R., to Transfer Systems Incorporated. Nuclear control rod having embedded filaments. 3,781,191, Cl. 176-86.00r.

Jones, John E.; and Knutson, Orville T., to Cummins-Allison Corporation, mesne. Method and apparatus for recording data by perforating record media. 3,780,938, Cl. 234-1.000.

Jones, John Leslie, Sr. Timing sensor switch with oscillating coil spring and metal mass contact. 3,781,496, Cl. 200-61.45r.

Jones, John Robert: *See—*
Davis, Paul Trevor; Glover, Terence George; and Jones, John Robert, 3,781,195.

Jones, Robert J.: *See—*
Burns, Eugene A.; and Jones, Robert J., 3,781,247.

Jones, Robert Keith, to Kenway Engineering, Incorporated. Article transfer device. 3,780,884, Cl. 214-8.50d.

Jones, Vincent. Trailing arm suspension system. 3,781,032, Cl. 280-124.00a.

Jonker, Simon: *See—*
Friebel, Hendrikus Johannes Christianos; Jonker, Simon; and Benschop, Gerardus Cornelis Marie, 3,780,429.

Jordan, Richard J., to General Marine, Inc. Waste disposal system and method. 3,780,757, Cl. 127-205.000.

Jorn, Raoul: *See—*
Jorn, Raoul; and Reichardt, Peter, 3,781,073.

Jorn, Raoul; and Reichardt, Peter, to Jorn, Raoul. Bearing. 3,781,073, Cl. 308-238.000.

Joslyn Mfg. and Supply Co.: *See—*
Vadnagara, Ramanlal R., 3,781,745.

Joyco, Inc.: *See—*
Kampaman, Joy M., 3,780,379.

Judd, Gordon W.; and Stout, Charles R., to Hughes Aircraft Company. Acoustic surface wave device eliminating spurious end reflections. 3,781,721, Cl. 333-30.00r.

Judd, O'Dean P., to Hughes Aircraft Company. Gas laser with discharge conditioning using ultraviolet photons generated in high current density preliminary discharge. 3,781,712, Cl. 331-94.500.

Juhran, Wolfgang: *See—*
Kampe, Wolfgang; Fauland, Erich; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 3,781,273.

Juillet, Francois; Teichner, Stanislas; and Formenti, Marc, to Agence Nationale de Valorisation de la Recherche (Anvar). Process for the photocatalytic oxidation of hydrocarbons into aldchydes and ketones. 3,781,194, Cl. 204-162.00r.

Julia, Marc, to Rhone-Poulenc S.A. Sulfone intermediates for the synthesis of vitamin A. 3,781,313, Cl. 260-402.000.

Julian, Clarence L., to General Motors Corporation. Vacuum-operated spark advance device. 3,780,713, Cl. 123-117.00a.

Juliano, Peter C.: *See—*
Kantor, Simon W.; and Juliano, Peter C., 3,781,378.

Jungjohann, Vernon H.: *See—*
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K-G Industries, Inc.: *See—*
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K-P Manufacturing Co., Inc.: *See—*
Helgerud, Robert J.; and Simon, Ernest M., 3,780,830.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
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Kabushiki Kaisha Hattori Tokeiten: *See—*
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Kabushiki Kaisha Meidensha: *See—*
Watanabe, Kazuo; Kito, Yastami; Nazaki, Choji; Kono, Kiichi; Tsuzuki, Kanemitsu; and Motobayashi, Kozo, 3,780,513.

Kabushiki Kaisha Sunpak: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Fujita, Kinji, 3,781,864.
Kurita, Masahiro; and Ota, Tomio, 3,780,521.
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Watanabe, Kazuo; Kito, Yastami; Nazaki, Choji; Kono, Kiichi; Tsuzuki, Kanemitsu; and Motobayashi, Kozo, 3,780,513.

Kadner, Martin: *See—*
Hackstein, Karl-Gerhard; Kadner, Martin; and Forster, Horst, 3,781,216.

Kadrmas, Kenneth A. Self-calibrating multiple field of view telescope for remote atmospheric electromagnetic probing and data acquisition. 3,781,552, Cl. 250-206.000.

Kafafian, Haig. Method of communication and/or testing of the handicapped. 3,781,802, Cl. 340-147.00r.

Kagans, Marc: *See—*
Pacault, Pierre Henri; and Kagans, Marc, 3,780,786.

Kahwati, Ghassan N.; Gade, John N.; Mac Kay, James D.; and Druzynski, Conrad J., to Eastman Kodak Company. Controls for spooling apparatus. 3,780,961, Cl. 242-67.30r.

Kaidzu, Hiromu: *See—*
Okuda, Minoru; Aikawa, Satoru; Kaidzu, Hiromu; and Tajima, Eiichi, 3,781,396.

Kaiserswerth, Hans-Peter: *See—*
Kirmis, Peter; Wagner, Heinz; and Kaiserswerth, Hans-Peter, 3,781,740.

Kalmar Verstaids AB: *See—*
Petersson, Ralf Krister Ebbe; and Holmberg, Bengt Roland, 3,781,035.

Kamezawa, Yasutoki: *See—*
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Kamijo, Tatsuo; and Nagakura, Densuke, to Mitsubishi Kakoki Kaisha. Inert gas system for a tanker. 3,781,407, Cl. 423-242.000.

Kamil, Zvi; Amir, Yoel; and Talmon, Omri, to Beta Engineering & Development Ltd. Liquid level detector. 3,781,498, Cl. 200-84.00c.

Kamp, Leonard F.; and Stoneham, Jeffrey R., to Eastman Kodak Company. Daylight mode compensating mechanism. 3,780,632, Cl. 95-11.001.

Kampaman, Joy M., to Joyco, Inc. Protective cap for infants. 3,780,379, Cl. 2-15.000.

Kampe, Robert F.; and White, Albert H., to Chandler Evans, Inc. Fluidic displacement transducer. 3,780,771, Cl. 137-829.000.

Kampe, Wolfgang; Fauland, Erich; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, to Boehringer Mannheim Gesellschaft mit beschrankter Haftung. N(6)-benzyl-adenosine compounds and therapeutic compositions. 3,781,273, Cl. 260-211.50r.

Kanebo, Ltd.: *See—*
Itabashi, Yoshio; Saito, Susumu; and Seki, Masao, 3,781,245.

Kaneko, Keiji; and Yoshida, Toshio, to Fuji Photo Film Co., Ltd. Cinematographic camera. 3,781,101, Cl. 352-221.000.

Kantor, Simon W.; and Juliano, Peter C., to General Electric Company. High temperature membrane materials. 3,781,378, Cl. 260-824.00r.

Kao Soap Co., Ltd.: *See—*
Katsumi, Mamoru; Sato, Toshio; and Hara, Tadao, 3,781,204.

Kappeler, Heinrich; and Wild, Jost, to Givaudan Corporation. Beta, beta-dimethyl acrylates. 3,781,333, Cl. 210-486.00r.

Kappus, Helmut: *See—*
Rodermund, Gerd; and Kappus, Helmut, 3,780,514.

Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, to Merck & Co., Inc. Product, process and composition. 3,781,415, Cl. 424-308.000.

Karin Limited: *See—*
Takabayashi, Teruo, 3,780,402.

Kasberg, Alvin H., to Atlantic Richfield Company. Spent nuclear fuel shipping casks. 3,781,189, Cl. 176-28.000.

Kashiwa, Norio: *See—*
Mori, Akikazu; Nara, Hideo; Kataoka, Toshiki; Kashiwa, Norio; Tokuzumi, Tadaichi; Horota, Yutaka; and Fujimura, Hiroshi, 3,781,253.

Kataoka, Toshiki: *See—*
Mori, Akikazu; Nara, Hideo; Kataoka, Toshiki; Kashiwa, Norio; Tokuzumi, Tadaichi; Horota, Yutaka; and Fujimura, Hiroshi, 3,781,253.

Katayama, Nobuaki: *See—*
Takahashi, Seihachi; Katayama, Nobuaki; and Morino, Hideki, 3,780,596.

Katchka, Jay R., to Robertshaw Controls Company. Dual lever mechanism. 3,780,600, Cl. 74-519.000.

Kato, Tadashi: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.

Kato, Yoshiaki; and Mabuchi, Hiroshi, to Citizen Watch Co., Ltd. Motion converter. 3,780,518, Cl. 58-23.00d.

Katona, William F., to Monogram Industries, Inc. Retractable recirculating toilet system module. 3,780,383, Cl. 4-10.000.

Katsumi, Mamoru; Sato, Toshio; and Hara, Tadao, to Kao Soap Co., Ltd. Textile treating composition. 3,781,204, Cl. 252-8.750.

Katzenmeyer, James H., to Continental Can Company. Cup carrier. 3,780,906, Cl. 220-113.000.

Kaufman, Peter; Colsen, F. Thomas; and Townsend, Robert L., to Educated Vehicle Systems, Inc. Auto alarm arming system. 3,781,854, Cl. 340-64.000.

Kauzlarich, James Joseph, to Research Corporation. Flastohydrodynamic bearing assembly. 3,781,071, Cl. 308-9.000.

Kawada Kogyo Kabushiki Kaisha: *See—*
Ohta, Masachika; and Wakameda, Toshio, 3,780,420.

Kawaguchi, Hiroshi; Naito, Takayuki; and Nakagawa, Susumu, to Bristol-Myers Company. Antibiotic derivatives of kanamycin. 3,781,268, Cl. 260-210.0ab.

Kawamata, Tsutomu: *See—*
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Almasi, George S.; Hendel, Robert J.; and Keefe, George E., 3,781,832.
Keefe, Jack D., to Monarch Marking Systems, Inc. Ultra-high molecular weight polyolefin optical reader tip. 3,781,555, Cl. 250-227.00r.
Keich, John D.; and Laliberte, George A., to United States of America, Navy. Releasable coupling. 3,781,055, Cl. 294-83.00a.
Keleman, Denis G.: *See—*
Galli, Richard J.; and Keleman, Denis G., 3,781,596.
Kellel, Allen, to Wemac Company. Remotely controlled ventilation valve. 3,780,980, Cl. 251-138.000.
Keller, Toni, to Spectrospin A.G. Method and apparatus for reducing interference in a spin resonance spectrometer by subtracting interferograms having 180° phase separation. 3,781,650, Cl. 324-.50r.
Keller, Wolfgang; Kersting, Arno; and Reuschel, Konrad, to Siemens Aktiengesellschaft. Apparatus for precipitating a layer of semiconductor material from a gaseous compound of the semiconductor material. 3,781,152, Cl. 425-174.80r.
Kelly, Robert C., to Upjohn Company, The. Bicyclic lactone diformate. 3,781,306, Cl. 260-343.300.
Kemp, Willard E., to ACF Industries, Incorporated. Control ports for gate valve structure. 3,780,982, Cl. 251-210.000.
Kennametal Inc.: *See—*
McCreery, James F., 3,780,408.
Kennedy, Howard V.: *See—*
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Kenway Engineering, Incorporated: *See—*
Jones, Robert Keith, 3,780,884.
Kerfoot, Franklin W., Jr.: *See—*
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Rhees, Raymond C., 3,781,412.
Kersting, Arno: *See—*
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Kersting, Raymond J., to Wagner Electric Corporation. Control valve. 3,781,065, Cl. 303-71.000.
Kessler, Clarence William: *See—*
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Kessler, Ernst Jakob: *See—*
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Ketchum, Marshall D.; and Bloomer, Milton D., to General Electric Company. Non-contacting temperature measurement of inductively heated utensil and other objects. 3,781,506, Cl. 219-10.490.
Keystone Lighting Corporation: *See—*
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Kichline, Thomas P.; and Conn, James F., to Monsanto Company. Alkyl lactoyl fumarates, miliates and salts thereof. 3,781,334, Cl. 260-484.00a.
Kidde, Walter, & Company, Inc.: *See—*
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Kikuchi, Junjiro, to Sankyo Kozaku Kogyo Kabushiki Kaisha. Automatic continuous record/playback means for tape cassette loading tape recorder. 3,781,019, Cl. 274-4.00e.
Kilby, Jack S. Binary encoding switch. 3,781,866, Cl. 340-347.00p.
Killen, Donald E., to Identification Systems, Inc. Fingerprint identification system and method. 3,781,855, Cl. 340-146.3ue.
Kimbrell, William C., to Phillips Petroleum Company. Process for forming yarn of improved properties. 3,780,516, Cl. 57-157.0ts.
Kime, Roger A. Filament coating apparatus. 3,780,699, Cl. 118-420.000.
Kimpel, Francis A.: *See—*
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King, Eugene, to Hoffmann-La Roche Inc. Cardiac pacer monitoring means with rate and pulse discrimination. 3,780,727, Cl. 128-2.06r.
King, James Frank: *See—*
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King, John F. DC to AC inverter. 3,781,643, Cl. 321-45.00c.
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Kinnear Corporation: *See—*
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Kinsey, Lewis R. Storage battery with exchangeable elements. 3,781,175, Cl. 136-7.000.
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Kitagawa, Hideji: *See—*
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Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Setting means for indicating apparatus. 3,780,525, Cl. 58-125.00c.
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Kitani, Hiroshi: *See—*
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Knowles, Charles R.; and Ruckel, Douglas J., to Atlantic Richfield Company. Pressure sealed cable packoff and method for making and using same. 3,781,456, Cl. 174-23.00r.
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Kugler, Carl J., to Singer Company, The. Low pressure index continuous integrator. 3,780,580, Cl. 73-233.000.
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Kuroda, Masataka: *See—*
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Levy, Robert E.: *See—*
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Linder, Henry, to Beatrice Foods Co., mesne. Reflector mount for spoked wheel. 3,781,082, Cl. 350-99.000.

Lindner, Ernst: *See—*
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Link, Gustav A. Automatic timing of watering control systems. 3,780,766, Cl. 137-624.200.

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Linz, Georg; and Sommer, Lothar. Ball-point pens. 3,781,123, Cl. 401-216.000.

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Litt, Morton H.: *See—*
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Little, Arthur D., Inc.: *See—*
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Lobowitz, Hyman R., to TRW Inc. Polyamide-imides and precursors thereof. 3,781,249, Cl. 260-78.0tf.

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Lockwood, John J., to GTE Sylvania Incorporated. Flexible helical spring antenna. 3,781,899, Cl. 343-880.000.

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Loewe Opta GmbH: *See—*
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Lofredo, Antony; and Biava, Domenick R., to Airco, Inc., mesne. Liquefaction of natural gas with product used as absorber purge. 3,780,534, Cl. 62-28.000.

Lohoff, Virgil Allan, to Memorex Corporation. Magnetic coating composition. 3,781,210, Cl. 252-62.540.

Lohoff, Virgil Allan, to Memorex Corporation. Magnetic coating composition. 3,781,211, Cl. 252-62.540.

Lohr, Raymond J.; Smith, James; and Bennett, Lowell L., to Marx, Louis, & Co., Inc., mesne. Roller coaster. 3,780,665, Cl. 104-69.000.

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McLeod, John W.; Gray, Laverne E.; and Booth, John F., 3,780,855.

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Long, Willis F.; and Lian, Kenneth T., to Hughes Aircraft Company. Circuit breaker and method. 3,781,606, Cl. 317-11.00a.

Longenecker, Ernst A. Trailer hitch lock. 3,780,546, Cl. 70-58.000.

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Loop A Line, Inc.: *See—*
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Lord, Michael Robert, to International Standard Electric Corporation. Loop current detector. 3,781,571, Cl. 307-235.00r.

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Lowery, Dennis J.; and Merchant, Robert E. Written message receiving and signaling holder. 3,781,844, Cl. 340-281.000.

Lowrance, Darrell J., to Lowrance Electronics, Inc. Apparatus for providing an indication of the depth of objects in water. 3,781,777, Cl. 340-3.00c.

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Lubowitz, Hyman R., to TRW Inc. Polyimide molding powders. 3,781,240, Cl. 260-37.0nt.

Lucas, Joseph, (Industries) Limited: *See—*
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Lukach, Jury Efimovich; Senatos, Vladimir Alexeevich; and Petukhov, Arkady Demyanovich. Disk extruder for processing polymeric materials. 3,781,153, Cl. 425-207.000.

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Lukacs, Michel J.; and Jacoby, Ian H., to Lukacs & Jacoby Associates. Serum separating method. 3,780,935, Cl. 233-1.00a.

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Lutz, Albert William, to American Cyanamid Company. Certain 6-tri fluoromethylcytosines and thiocytosines, their synthesis, and their use in the synthesis of uracils and thiouracils. 3,781,324, Cl. 260-465.00d.
Ly, Manuel G.: *See—*
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Lynch, James Edward, to AMP Incorporated. Method of making an electrical connection using a coined post with solder stripe. 3,780,433, Cl. 29-628.000.
Lysle, Gordon, to Lysle, Gordon, Incorporated. Optical apparatus for producing and/or using photoconductive film having a specular surface selectively deformed in image areas thereof. 3,781,106, Cl. 355-9.000.
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Madgy, Milton H. Orthopedic foot appliance. 3,780,742, Cl. 128-588.000.
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Magnoni, Franco: *See—*
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Maguire, Mary Helen; Gough, Geoffrey; and Michal, Frank, to University of Sydney, The. 2-Methylthioadenosine-5'-monophosphate. 3,781,274, Cl. 260-211.50r.
Maidens, John Eric; Hartley, Kenneth Alison; and Carrotte, Frederick Henry, to Courtaulds Limited. Patterning devices for knitting machines. 3,780,540, Cl. 66-50.00b.
Maier, Howard A., to American Optical Corporation. Multiple bullet and cartridge mount for forensic microscope. 3,780,614, Cl. 86-1.00r.
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Malec, Jerry P. Airless spray gun. 3,780,953, Cl. 239-526.000.
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Manacini, Lloyd; and Ysteboe, Howard T., to Du Pont de Nemours, E. I., and Company. Connector block. 3,781,760, Cl. 339-59.00m.
Mancini, Lloyd, to Du Pont de Nemours, E. I., and Company. Circuit board socket. 3,781,770, Cl. 339-259.00r.
Mankowsky, Vincent J.; and Ceroke, Clarence J., to U.S. Industries, Inc. Prefill valve for molding machines. 3,781,160, Cl. 425-450.000.
Mann, John Brien, to Metropolitan Tool and Products Limited. Cable reeling drums. 3,780,538, Cl. 64-30.00c.
Manning Environmental Corporation, mesne: *See—*
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Manuel, Larry N. Camper tie down arrangement. 3,781,057, Cl. 296-23.0mc.
Marathon Oil Company: *See—*
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Marini, Roberto, to Societe Italiana Telecommunicazioni Siemens S.p.A. Stabilized direct-current converter responsive to off-period current. 3,781,653, Cl. 323-17.000.
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Marsh, Robert W.; and Mooers, Alden J., to Control Data Corporation. Position indicating system for indicating deangular position of a continuously rotating member utilizing counter means. 3,781,114, Cl. 356-152.000.
Marshall, Howard D.; Gordon, Gary B.; Pipkin, Jesse E.; and Adler, Robin, to Hewlett-Packard Company. Tristate pulse generator for producing consecutive pair of pulses. 3,781,689, Cl. 328-61.000.
Marshall, John J., to Aicheles Associates, Inc. Trailer brake control system. 3,780,832, Cl. 188-3.00r.
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Martin, Henry; and Drabek, Jozef. Control of insects, nematodes and acarinae with phosphonyl-carbamyloxy-phosphonates. 3,781,425, Cl. 424-204.000.
Martin, James M.; and Thomas, Michael D., to Gillette Company, The. Hair steamer. 3,781,519, Cl. 219-273.000.
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Maruyama, Dennis T.: *See—*
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Maruyama, Isamo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Akatsu, Mitsuihiro; Maruyama, Isamo; and Izumi, Takahiro, 3,781,299.
Marvin, Edgar S.: *See—*
Jenkins, Gerald L.; Jungjohann, Vernon H.; and Marvin, Edgar S., 3,781,100.
Marwede, Gunter: *See—*
Pampus, Gottfried; Schon, Nikolaus; Witte, Josef; and Marwede, Gunter, 3,781,257.
Marx, Louis, & Co., Inc., mesne: *See—*
Lohr, Raymond J.; Smith, James; and Bennett, Lowell L., 3,780,665.
Maryatt, Michael B.; and McCoy, James M., to Avco Corporation, mesne. Magnetic head transducer. 3,781,486, Cl. 179-100.20c.
Maserjian, Joseph: *See—*
United States of America, National Aeronautics and Space Administration, 3,781,549.
Mason, Edwin E.: *See—*
Fretwell, Richard D.; Azbell, James W.; and Mason, Edwin E., 3,781,817.
Masoneilan International, Inc.: *See—*
Borg, Karl Stanley; and Boger, Henry W., 3,780,767.
Massachusetts Institute of Technology: *See—*
Smith, Joseph L., Jr.; Thullen, Philip; and Kirtley, James L., Jr., 3,781,578.
Masters, Frank C.: *See—*
Dodson, Merritt E.; Marsh, Richard L.; and Masters, Frank C., 3,781,067.
Mastic Corporation: *See—*
Mattes, Lee Herbert, 3,780,483.
Mathis, Ronald D.; and Guillory, Jack P., to Phillips Petroleum Company. Light stabilized polypropylene containing a hindered phenol a phosphite and a benzotriazole. 3,781,242, Cl. 260-45.70p.
Matkovsky, Petr E.: *See—*
Shilov, Alexandr E.; Dyachkovsky, Fridrikh S.; Chirkov, Nikolai Mikhailovich; Matkovsky, Petr E.; Aronovich, Khaim-Mordkhe; Beikhold, Alina A.; and Russian, Ljudmila, 3,781,220.
Matson, Robert P. Structural panel. 3,780,485, Cl. 52-665.000.

Matsuda, Tsutomu; and Takagi, Makoto, to Nippon Air Brake Co., Ltd., The. Automatic speed control means for a marine engine. 3,780,755, Cl. 137-110.000.
Matsumoto, Takao. Logarithmic recording system. 3,781,679, Cl. 324-115.000.
Matsumoto, Teruo, to Epoch Company, Ltd. Basketball game amusement device. 3,781,010, Cl. 273-85.00c.
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiari, Hisashi, to Honshu Paper Company Limited. Apparatus for producing multilayer fibrous structures. 3,781,150, Cl. 425-80.000.
Matsuo, Noriaki: *See*—
Chono, Masazumi; Nakajima, Hitoshi; Taguchi, Masayoshi; and Matsuo, Noriaki, 3,781,336.
Matsushita Electric Industrial Co., Ltd.: *See*—
Nakajima, Takatsugu, 3,781,450.
Oka, Shunzo; and Nishioka, Matsuo, 3,781,752.
Tonari, Hirohiko, 3,780,594.
Tsukamoto, Masahide; and Ohtsuka, Tetsuro, 3,781,088.
Matsushita Electric Works, Ltd.: *See*—
Inoue, Hiromitsu; Okamoto, Shinsuke; Mori, Hirokazu; and Ohasi, Hirosi, 3,781,772.
Matsushita Graphic Communication Systems, Inc.: *See*—
Nakano, Ryunosuke; and Fujiyama, Yoshiyuki, 3,780,914.
Mattern, John, to Westinghouse Electric Corporation. Analog to digital converter. 3,781,871, Cl. 340-347.0ad.
Mattes, Lee Herbert, to Mastic Corporation. Building siding unit with interlocking backing board and outer panel. 3,780,483, Cl. 52-550.000.
Matthews, Ralph W.; and Schott, Robert E., to Allis-Chalmers Corporation. Hydraulic valve. 3,780,762, Cl. 137-596.000.
Matzen, Walter T.: *See*—
Stehlin, Robert A.; Spence, Hilton W.; and Matzen, Walter T., 3,781,680.
Maue, Marilyn J. Timepiece including a color cylinder and another time indicator displayed on a different plane. 3,780,526, Cl. 58-126.00r.
Maurin, Jean: *See*—
Weisang, Joseph Edouard; Szabo, Georges; and Maurin, Jean, 3,781,222.
Mauritz, Frank A. Spring clip. 3,780,403, Cl. 24-261.00d.
Mauvernay, Roland Yves; Busch, Norbert; Simond, Jacques; and Moleyre, Jacques, to Centre Europeen de Recherches Mauvernay. Coronaro-dilating and antianoxemic medicines. 3,781,432, Cl. 424-250.000.
May, Francis A., to Consolidation Coal Company. Insulated cable splice and method for making the same. 3,781,458, Cl. 174-84.00c.
May, Frederick T., to International Business Machines Corporation. Machine log system. 3,781,813, Cl. 340-172.500.
Mayer, George L., Jr.; and Dobbins, David L., to Coded Signatures, Inc. Data encoding and decoding apparatus and method. 3,781,109, Cl. 355-52.000.
Mayer, Oscar, & Co., Inc.: *See*—
Jensen, Hans A.; and Layman, Melvin M., 3,780,486.
Mazin, Evgeny Petrovich: *See*—
Sokolsky, Dmitry Vladimirovich; Zakumbaeva, Gaukhar Daulenovna; Zhubanov, Kair Akhmetovich; Mazin, Evgeny Petrovich; Scheolov, Nikolai Illarionovich; Fokin, Evgeny Pavlovich; and Livanov, Vladimir Arkadievich, 3,781,227.
Mazzone, Charles P. Process and apparatus for texturizing yarn. 3,780,404, Cl. 28-1.300.
McCaffery, Dennis. Anti-spill container. 3,781,164, Cl. 431-291.000.
McCaldin, James: *See*—
Jenkins, Robert; Mead, Carver A.; and McCaldin, James, 3,780,427.
McCann, David H., Jr.: *See*—
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blai..a, Franklyn C., 3,781,574.
McCarthy, Charles: *See*—
Nishi, Hiroshi H.; and McCarthy, Charles, 3,780,992.
McCarthy, John Felix: *See*—
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McClure, Benton J.: *See*—
Shear, Wayne G.; Spratt, Brendan J.; and McClure, Benton J., 3,781,803.
McCollum, James H., Jr., to Collins Radio Company. N-way analog signal fader. 3,781,912, Cl. 330-51.000.
McComb, Richard C., to Veeder Industries Inc. Rotary electromagnetic indicator. 3,781,876, Cl. 340-378.0mw.
McConnell, Robert G.: *See*—
Abramson, Paul B.; and McConnell, Robert G., 3,781,529.
McCoy, James M.: *See*—
Maryatt, Michael B.; and McCoy, James M., 3,781,486.
McCreery, James F., to Kennametal Inc. Cutting Tool. 3,780,408, Cl. 29-96.000.
McDonald, James C., Jr. Ship hull construction. 3,780,687, Cl. 114-41.000.
McDonnell, Robert William; and Win, Maung Hla, to Colgate-Palmolive Company. Laundry product containing enzyme. 3,781,228, Cl. 252-539.000.
McErlane, James E.: *See*—
Ambrose, William J.; and McErlane, James E., 3,780,984.
McFarlan, A. I., Company Incorporated: *See*—
Blackwell, Sam M., 3,780,941.
McGee, John K.: *See*—
Phipps, Willis M.; Holbert, Marvin L., Jr.; and McGee, John K., 3,780,802.
McGill, Robert W.; and Painter, P. Eric, to A-T-O, Inc. Film shaping apparatus. 3,780,628, Cl. 93-82.000.
McGovern, Harold Joseph, Jr.; and Granja, Louis Albert, to United Brands Company. Variable-length conveyor. 3,780,843, Cl. 193-35.0te.
McGovern, Terrence L.: *See*—
Osborne, Eugene F.; and McGovern, Terrence L., 3,781,706.
McGuire, Stephen E., to Continental Oil Company. Alkyl phthalic acid compounds. 3,781,340, Cl. 260-515.00p.
McKee, Arthur G., & Company: *See*—
Glover, Warren E., 3,780,890.
McKerreghan, Michael H., to Texas Instruments, Incorporated. Glass dual-in-line header. 3,781,457, Cl. 174-52.00s.
McKinney, Joel D.: *See*—
Bryson, Millard C.; McKinney, Joel D.; Titmus, Robert A.; and White, Frederick K., 3,781,197.
McLaren, Edwin C.; and Lund, Raymond, to Hoerner-Waldorf Corporation. One piece reclosable carton. 3,780,932, Cl. 229-37.00r.
McLeod, John W.; Gray, Laverne E.; and Booth, John F., to Lone Star Container Corporation. Winding board. 3,780,855, Cl. 206-50.000.
McMahon, Maurice T., Jr., to International Business Machines Corporation. AC performance test for large scale integrated circuit chips. 3,781,670, Cl. 324-57.00r.
McMurtry, David Roberts, to Rolls-Royce Limited. Variable pitch rotary blading. 3,781,131, Cl. 416-155.000.
McSahee, Welbourne D., to Loop A Line, Inc. Line-post couplings and marine mooring-towing devices. 3,780,690, Cl. 114-218.000.
McSwiggin, James L., to Proctor & Gamble Company, The. Sliding pallet article sorter. 3,780,850, Cl. 198-31.0ac.
Mead, Carver A.: *See*—
Jenkins, Robert; Mead, Carver A.; and McCaldin, James, 3,780,427.
Mead Corporation, The: *See*—
Werner, Charles E., 3,780,396.
Meagher, Thomas, to Xerox Corporation. Constant current biasing transfer system. 3,781,105, Cl. 355-3.000.
Medi-Dise, Inc.: *See*—
Braverman, Milton, 3,780,856.
Mefina S.A.: *See*—
Fresard, Marcel, 3,781,075.
Meier, Johann Hans, to International Business Machines Corporation. Print hammer with moving coil. 3,780,650, Cl. 101-93.00c.
Meier, Udo: *See*—
Mokrytzki, Boris; and Meier, Udo, 3,781,615.
Meininger, Fritz; and Fuchs, Hermann, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for preparing navy-blue and grey 1:2 chromium and cobalt complex azodyestuff mixtures for natural and synthetic polyamide and polyurethae fibres. 3,781,168, Cl. 8-26.000.
Meininger, Fritz; and Springer, Hartmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Water-soluble anthraquinone dyestuffs. 3,781,310, Cl. 260-374.000.
Melead, James J.; and Wentworth, William P., to Beloit Corporation. Reversible coater. 3,780,697, Cl. 118-65.000.
Melle-Benzons: *See*—
Gobron, Georges; and Pipon, Robert, 3,781,373.
Memorex Corporation: *See*—
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Lohoff, Virgil Allan, 3,781,211.
Memory Corporation: *See*—
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Menard, Jean Paul: *See*—
Lefevre, Georges; and Menard, Jean Paul, 3,781,694.
Menger, Keith J., to Sheller-Globe Corporation. Remote control mirror. 3,780,598, Cl. 74-501.00m.
Menkel, Gary G., to Design Center, Inc., mesne. Screw cap closure. 3,780,898, Cl. 215-43.00r.
Mensor Corporation: *See*—
Fruit, Jerry L., 3,780,589.
Merchant, Robert E.: *See*—
Lowery, Dennis J.; and Merchant, Robert E., 3,781,844.
Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr., 3,781,430.
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,781,415.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Welters, Reiner; and Russmann, Horst, 3,781,417.
Meridian Industries, Inc.: *See*—
Heidel, Rodney L., 3,781,651.
Merola, Anthony, to Amerola Products Corporation, mesne. Gripping device. 3,780,923, Cl. 226-151.000.
Merrilees, James Drummond, to Bendix Westinghouse, Limited. Wheel balancing apparatus. 3,780,592, Cl. 73-457.000.
Merten, Rudolf: *See*—
Zecher, Wilfried; and Merten, Rudolf, 3,781,246.
Mesing, Arthur E., to United Aircraft Corporation. Vortex oil-water separator system providing clean water. 3,780,862, Cl. 210-84.000.
Messer Griesheim G.m.b.H., mesne: *See*—
Dauer, Horst; and Hildebrandt, Peter, 3,781,508.
Messier, Albert J. Concrete form assembly having expandable inner core. 3,780,976, Cl. 249-14.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Dorr, Karl-Heinz; Grimm, Hugo; and Kola, Rolf, 3,780,499.

Metropolitan Tool and Products Limited: *See—*
Mann, John Brien, 3,780,538.
Meuller, Helge, AB: *See—*
Meuller, Karl Helge, 3,781,566.
Meuller, Karl Helge, to Meuller, Helge, AB. Detecting the presence of a medium in the path of a sound or light wave. 3,781,566, Cl. 307-116.000.
Meyer, Hans Rudolf: *See—*
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,781,278.
Meyer, Lloyd E., to Westinghouse Electric Corporation. Interleaved winding for electrical inductive apparatus. 3,781,739, Cl. 336-70.000.
Michal, Frank: *See—*
Maguire, Mary Helen; Gough, Geoffrey; and Michal, Frank, 3,781,274.
Michatek, Chester W., to Eastman Kodak Company. Film cartridge. 3,780,633, Cl. 95-19.000.
Michaud, Treffle; Hubert, Lucien; and Poulin, Gerard, to Universite de Sherbrooke. Ground effect dolly. 3,780,823, Cl. 180-121.000.
Micromedic Systems, Inc.: *See—*
Sanz, Manuel Claude, 3,780,912.
Microsystems International Limited: *See—*
Loro, Alberto, 3,781,611.
Microwave Associates, Inc.: *See—*
Durkee, Earle Frederick, 3,781,719.
Middleman, Dirk-Friedrich: *See—*
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Miericke, Jurgen; Hieronymus, Hans; and Pawlitschek, Franz, to Siemens Aktiengesellschaft. Electro-magnetic system for the guided suspension of a moving vehicle. 3,780,667, Cl. 104-148.0ms.
Mihailoviski, Alexander; and Baker, Don R. Phosphorylated thiourea compositions. 3,781,326, Cl. 260-470.000.
Milenuszkin, Walenty: *See—*
Doerffer, Jerzy; and Milenuszkin, Walenty, 3,780,683.
Miles, Harry Victor, II, to Dorr-Oliver Incorporated. Pressure filter having depending tubular filter elements. 3,780,868, Cl. 210-333.000.
Milgrom, Jack: *See—*
Finestone, Arnold B.; Milgrom, Jack; and Slovenkai, Stephen V., 3,781,384.
Millard, Barry John, to Adwest Engineering Limited. Method of producing cylindrical components. 3,780,412, Cl. 29-157.10r.
Miller, Allan F.: *See—*
Whipple, Roger B.; and Miller, Allan F., 3,780,842.
Miller, Blaine Monroe, Jr.; Buckman, Wayne T.; and Warner, Ellis R., Jr., to Hobart Manufacturing Company, The, mesne. Liquid level control for pulping apparatus. 3,780,956, Cl. 241-34.000.
Miller, David P., to United Aircraft Corporation. Vortex oil-water separator system providing clean water. 3,780,865, Cl. 210-195.000.
Miller, Herman, Inc.: *See—*
Propst, Robert L., 3,780,387.
Miller, Leonidas C. Well pressure measuring and recording device. 3,780,574, Cl. 73-151.000.
Millington, Robert G., to Hims, Inc. Safety apparatus. 3,781,052, Cl. 294-25.000.
Milo, William C., to United States of America, Army. Cryogen temperature indicator. 3,780,585, Cl. 73-362.0sc.
Mine Safety Appliances Company: *See—*
Giebel, Joseph L.; and Temple, Ernest E., 3,780,689.
Minisci, Francesco; Galli, Remo; and Quilico, Adolfo, to Montecatini Edison S.p.A. Process for the preparation of amides of nitrogen heterocyclic compounds. 3,781,286, Cl. 260-250.00r.
Mink, James W.: *See—*
Christian, Joseph Robert; Goubau, Georg J. E.; and Mink, James W., 3,781,546.
Minnesota Mining and Manufacturing Company: *See—*
Janssen, Edward W.; and Kyle, Robert C., 3,781,231.
Minolta Camera Kabushiki Kaisha: *See—*
Miyajima, Tohru; Ichimoto, Yoshiharu; and Saeki, Arinori, 3,781,625.
Ogawa, Masaya; and Seino, Kuniki, 3,781,108.
Sumita, Haruki, 3,781,090.
Miram, Horst; and Sehner, Karl Heinz, to Windmoller & Holscher. Multicolour printing press comprising a backing cylinder containing heating chambers. 3,780,796, Cl. 165-39.000.
Mirviss, Stanley B.: *See—*
Greco, Carl C.; Mirviss, Stanley B.; and Martell, Arthur E., 3,781,296.
Mishcon, Lester, to Singer Company, The. Needle actuating camming for circular knitting machines. 3,780,539, Cl. 66-42.000.
Mita Industrial Company Limited: *See—*
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 3,781,208.
Mitchell, George B.: *See—*
Halasa, Adel F.; and Mitchell, George B., 3,781,263.
Mitchell, John K. Radar side lobe echo eliminator. 3,781,889, Cl. 343-17.10r.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kitamura, Tetsuo; and Tamai, Akira, 3,780,619.
Mitsubishi Kakoki Kaisha: *See—*
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Mitsui Petrochemical Industries, Ltd.: *See—*
Mori, Akikazu; Nara, Hideo; Kataoka, Toshiki; Kashiwa, Norio; Tokuzumi, Tadaichi; Horota, Yutaka; and Fujimura, Hiroshi, 3,781,253.
Miyajima, Tohru; Ichimoto, Yoshiharu; and Saeki, Arinori, to Minolta Camera Kabushiki Kaisha. Plural motor, plural control station planetarium. 3,781,625, Cl. 318-547.000.
Miyamoto, Yoshio: *See—*
Yoshida, Kenichi; and Miyamoto, Yoshio, 3,781,725.
Mizushima, Yoshihiko; and Sudo, Tsuneta, to Nippon Telegraph and Telephone Public Corporation. Semiconductor switching element and a semiconductor switching involving the same. 3,781,806, Cl. 340-166.00r.
Mobil Oil Corporation: *See—*
Braid, Milton, 3,781,206.
Schwartz, Albert B., 3,781,225.
Schwartz, Albert B., 3,781,226.
Modglin, Donald D. Apparatus for exhibiting display panels. 3,780,459, Cl. 40-36.000.
Moehrle, Earl R.: *See—*
Reichert, Gilbert A.; and Moehrle, Earl R., 3,781,499.
Moeller & Neumann G.m.b.H.: *See—*
Wagner, Ruprecht, 3,780,882.
Mokrytzki, Boris; and Hammond, Peter W., to Westinghouse Air Brake Company. Induction motor control system. 3,781,614, Cl. 318-227.000.
Mokrytzki, Boris; and Meier, Udo, to Westinghouse Air Brake Company. System for phase shifting inverters to obtain a variable modulated waveform. 3,781,615, Cl. 318-227.000.
Mokrytzki, Boris, to Westinghouse Air Brake Company. Induction motor control system. 3,781,616, Cl. 318-230.000.
Moldovanyi, Laszlo: *See—*
Hennart, Claude; Moldovanyi, Laszlo; and Roth, Willy, 3,781,428.
Moleyre, Jacques: *See—*
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Molloy, Bryan B.: *See—*
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Momsen, Marc F.: *See—*
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Monarch Marking Systems, Inc.: *See—*
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Rader, Edwin R.; and Ripley, Clarence A., Jr., 3,781,115.
Monogram Industries, Inc.: *See—*
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Monsanto Company: *See—*
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Marco, Gino J.; and Grainger, Robert B., 3,781,440.
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Monsanto Company, mesne: *See—*
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Monsanto Research Corporation: *See—*
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Monser, George J., to Raytheon Company. Combined pitot tube and antenna. 3,781,895, Cl. 343-708.000.
Montecatini Edison S.p.A.: *See—*
Minisci, Francesco; Galli, Remo; and Quilico, Adolfo, 3,781,286.
Mooers, Alden J.: *See—*
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Moore Industries Inc.: *See—*
Moore, Leonard; and Bodle, Ronald L., 3,781,724.
Moore, Leon E. Automatic concrete forming machine for producing high density products. 3,781,156, Cl. 425-424.000.
Moore, Leonard; and Bodle, Ronald L., to Moore Industries Inc. Terminal block. 3,781,724, Cl. 333-79.000.
Moore, William G.: *See—*
Action, Floyd; Cochran, Paul E.; and Moore, William G., 3,781,622.
Moore, William J.: *See—*
Bishop, Stephen G.; and Moore, William J., 3,781,748.
Moose, Robert R. Aircraft glide slope instrumentation system. 3,781,891, Cl. 343-108.00r.
Morandi, Battista: *See—*
Siclari, Francesco; Magnoni, Franco; and Morandi, Battista, 3,781,213.
Morel, Andre, to Constructions Mecaniques F. Laroche & Fils. Fiber opening machine. 3,780,399, Cl. 19-97.000.
Morgan, Barrie O.: *See—*
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Morgan, John A.: *See—*
Whitson, Bobbie L.; and Morgan, John A., 3,780,761.
Morgan, Robert L.: *See—*
Evers, Ernst T.; and Morgan, Robert L., 3,780,967.
Mori, Akikazu; Nara, Hideo; Kataoka, Toshiki; Kashiwa, Norio; Tokuzumi, Tadaichi; Horota, Yutaka; and Fujimura, Hiroshi, to Mitsui Petrochemical Industries, Ltd. Process for the preparation of ethylene polymer or copolymer. 3,781,253, Cl. 260-85.30r.

Mori, Chiharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Dual light-measurement and compensation circuitry for cameras. 3,781,119, Cl. 356i222.000.

Mori, Chiharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronic shutter-control circuits for cameras. 3,781,551, Cl. 250-214.00p.

Mori, Hirokazu: *See—*
Inoue, Hiromitsu; Okamoto, Shinsuke; Mori, Hirokazu; and Ohasi, Hirosi, 3,781,772.

Mori, Kazumasa: *See—*
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Morin, Joseph C.: *See—*
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Morino, Hideki: *See—*
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Morris, Derek S., to United States of America, Army. Data diversity combining technique. 3,781,794, Cl. 340-146.10r.

Morris, Marvin L., Jr.; Pope, Hermon L., Jr.; and Ruggiero, Edward M., to Texas Instruments, Incorporated. Integrated heater element array and drive matrix. 3,781,515, Cl. 219-216.000.

Morris, Stanley M.: *See—*
Harnstone, Leonard A.; Levy, Robert E.; Morris, Stanley M.; Lopez, Alfredo M.; Mosler, Henry A.; and Bartman, Robert V., 3,781,533.

Morrison, Evans Lewis. Method for evaluating elevator performance. 3,781,901, Cl. 346-1.000.

Morrow, Dennis W., to Eagle Industries, Inc. Boom assembly for lift and tow truck. 3,780,878, Cl. 212-59.00r.

Morton, Ralph B.: *See—*
Frye, James A.; Morton, Ralph B.; and Vogler, Charles W., 3,780,675.

Mosler, Henry A.: *See—*
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Moss, Eual A.: *See—*
Boudreau, Paul E.; Dixon, Roy C.; Donnan, Robert A.; and Moss, Eual A., 3,781,815.

Moss, Gerald; and Rosborough, Dennis F., to Esso Research and Engineering Company. Recovery of sulphur. 3,781,445, Cl. 423-574.000.

Motobayashi, Kozo: *See—*
Watanabe, Kazuo; Kito, Yastami; Nazaki, Choji; Kono, Kiichi; Tsuzuki, Kanemitsu; and Motobayashi, Kozo, 3,780,513.

Motorola, Inc.: *See—*
Cayton, Thomas C., Jr., 3,781,018.
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Salners, Edward A., 3,781,730.

MTL Incorporated: *See—*
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Mueller, Kurt Hugo, to Bell Telephone Laboratories, Incorporated. Automatic tap-gain incrementation of adaptive equalizers. 3,781,720, Cl. 333-18.000.

Muhlbauer, Alfred: *See—*
Reuschel, Konrad; Dietze, Wolfgang; Muhlbauer, Alfred; and Sandmann, Herbert, 3,781,209.

Muhlrad, Wolf, to Air Industrie, mesne. Adsorption of fluorine and fluorine compounds on alumina. 3,780,497, Cl. 55-71.000.

Muilwijk, Dirk: *See—*
Van Loon, Lambertus Jacob Willem; and Muilwijk, Dirk, 3,781,696.

Mukoyama, Eiji: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.

Muller, Erwin; Wirth, Wolf-Dieter; Blahak, Johannes; and Rohr, Harry, to Bayer Aktiengesellschaft. Blowing agents. 3,781,233, Cl. 260-2.50r.

Mulvey, Dennis M.: *See—*
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 3,781,284.

Mummey, Dale Brice: *See—*
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Munday, Theodore F.; and Radimer, Kenneth J., to FMC Corporation. Stabilization of hydrogen peroxide. 3,781,409, Cl. 423-273.000.

Mundy, Joseph L.: *See—*
Neugebauer, Constantine A.; and Mundy, Joseph L., 3,781,831.

Munson, Harold C., to Remington Arms Company, Inc. Universal-type package for firearms. 3,780,487, Cl. 53-35.000.

Murakoshi, Makoto; Ooue, Shingo; Ueda, Hiroyuki; Hashiue, Masakazu; and Endo, Hirotoshi, to Fuji Photo Film Co., Ltd. Retrieval method in reading dictionaries. 3,781,809, Cl. 340-172.500.

Murashima, Noboru: *See—*
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Murray, Dudley Charles, to W4: Pains-Wessex - Wessex Limited. Pyrotechnic devices. 3,780,656, Cl. 102-37.600.

Murray, Thomas J.: *See—*
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Murray, William K., mesne: *See—*
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Muse, George B. Universal blocks. 3,780,484, Cl. 52-585.000.

Myers Double Tee Structures, Inc., mesne: *See—*
Tomkins, Harold E., 3,780,481.

Myers, John W., to Phillips Petroleum Company. Isomerization of neohexene. 3,781,377, Cl. 260-683.200.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,781,270.

Naeseth, Manley H.; and Larrimore, Herbert, to United States of America, Navy. Illuminated diver's slate. 3,781,536, Cl. 240-2.250.

Nafziger, Nelson: *See—*
Canfield, Richard; and Nafziger, Nelson, 3,780,644.

Nagakura, Densuke: *See—*
Kamijo, Tatsuo; and Nagakura, Densuke, 3,781,407.

Nagaski, Jin, to Kabushiki Kaisha Suwa Seikosha. Molding construction of plates of liquid crystal display. 3,781,087, Cl. 350-160.01c.

Naito, Okito, to Kabushiki Kaisha Suwa Seikosha. Watches having liquid crystal displays. 3,780,523, Cl. 58-50.00r.

Naito, Takayuki: *See—*
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Najarian, John, to France Neckwear Co. Inc. Bow ties. 3,780,381, Cl. 22-1.540.

Nakagawa, Susumu: *See—*
Kawaguchi, Hiroshi; Naito, Takayuki; and Nakagawa, Susumu, 3,781,268.

Nakahara, Tsuneo; Kurauchi, Noritaka; Kitani, Hiroshi; Takemura, Kenji; and Kuroda, Masataka, to Sumitomo Electric Industries, Limited. Wireless communication system for railway vehicle including an open type transmission line mounted on a radiowave absorbnt support. 3,781,687, Cl. 325-52.000.

Nakajima, Hitoshi: *See—*
Chono, Masazumi; Nakajima, Hitoshi; Taguchi, Masayoshi; and Matsuo, Noriaki, 3,781,336.

Nakajima, Takatsugu, to Matsushita Electric Industrial Co., Ltd. Signal-selecting system for an electronic musical instrument. 3,781,450, Cl. 84-1.010.

Nakajima, Takeaki: *See—*
Kometani, Yutaka; Koizumi, Shun; Suzuki, Takeshi; Nakajima, Takeaki; and Okuno, Chuzo, 3,781,258.

Nakajima, Tohru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light-distribution system for photocomposers. 3,780,630, Cl. 95-4.500.

Nakano, Ryunosuke; and Fujiyama, Yoshiyuki, to Matsushita Graphic Communication Systems, Inc. Developer particle supply device. 3,780,914, Cl. 222-407.000.

Nakao, Kenji: *See—*
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Nakao, Masaaki; Shiiki, Zenya; and Amagi, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Lightweight metal composite material and process for producing same. 3,781,170, Cl. 29-182.500.

Nalco Chemical Company: *See—*
Bott, Lawrence L., 3,780,806.

Nally, Phillip L. Alarm device. 3,780,692, Cl. 416-5.000.

Nambu, Shyuya; and Etoo, Yukihiro, to Nissan Motor Company, Limited. Carburetor for an internal combustion engine. 3,780,718, Cl. 123-179.00g.

Nancy, Denise; and Ninet, Leon, to Rhone-Poulenc S.A. Compositions for the nutrition of animals. 3,781,421, Cl. 424-118.000.

Nankivell, Erby Roy, Jr., to Ralide, Inc. Molded saddle tree and metallic saddle horn. 3,780,494, Cl. 54-44.000.

Napier, John M.; and Caputo, Anthony J. Method for providing metallic carbide coating and graphite. 3,781,173, Cl. 117-95.000.

Nara, Hideo: *See—*
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Nattefort, Fritz, to Rockwell International Corporation. Bearing arrangement. 3,781,072, Cl. 308-15.000.

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Neale, Robert Schwenn, to Union Carbide Corporation. Production of allylic ethers. 3,781,368, Cl. 260-611.00r.

Neel, Robert M.; and Johnson, Robert C., to Reynolds, R. J., Tobacco Company. Recovery of organic liquids used for treating tobacco. 3,780,744, Cl. 131-143.000.

Neighbour, Frank: *See*—
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Nelson, Ronald C.; and Grover, Lawrence L., to Heath Company. Automatic battery charger. 3,781,631, Cl. 320-25.000.
Nelson, Victor J.: *See*—
Paasschens, Cornelis W. M.; and Nelson, Victor J., 3,781,000.
Nemoto, Yuhei; and Takahashi, Shiro, to Dainippon Ink and Chemicals, Incorporated. Photopolymerizable printing ink. 3,781,214, Cl. 260-22.0tn.
Neugebauer, Constantine A.; and Mundy, Joseph L., to General Electric Company. Read only memory utilizing floating gate transistors and method of programming. 3,781,831, Cl. 340-173.00r.
Neumann, Gernot, to Hanning Elektro-Werke, Robert Hanning, Firma. Electro-mechanical lifting device. 3,781,623, Cl. 318-481.000.
Neuro-Data, Inc.: *See*—
John, Erwin Roy, 3,780,724.
Newby, Billie J.; and Rhodes, Donald W., to United States of America, Atomic Energy Commission. Method of repressing the precipitation of calcium fluozirconate. 3,781,217, Cl. 252-301.10w.
Newcomb, Arthur L., Jr.; and Price, Aubrey G., to United States of America, National Aeronautics and Space Administration. Attitude sensor. 3,780,966, Cl. 244-1.0sa.
Newlen, Kenneth W.: *See*—
Hanes, James Gordon, Jr.; King, James Frank; Lathery, Willie M.; Beamon, Howard L.; and Newlen, Kenneth W., 3,780,679.
Newstead, Charles, to Girling Limited. Brake adjuster mechanisms. 3,780,836, Cl. 188-79.5sc.
Nichols, Parks M.: *See*—
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Nickell, Claude H.: *See*—
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Nickell, Claude H., to Nickell, Claude H., Weldon, Winfred D., Pinke, Manuel and Pianga, Adam. Refrigerant compressor for vehicles. 3,781,135, Cl. 417-295.000.
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Krivoshiev, Cueorgui Petrov; Kolev, Dimiter Christov; Tanev, Christo Yanakiev; Erinkov, Dimiter Kostadinov; Petrov, Gueorgui Slavov; Vassilev, Alexander Traykov; and Vatev, Petko Slavtchev, 3,781,554.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, to Ciba-Geigy AG. Phenyl carbamates. 3,781,301, Cl. 260-327.00m.
Nikles, Erwin, to Ciba-Geigy AG. Orthoaminophenyl-N-methylcarbamates. 3,781,330, Cl. 260-479.00c.
Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Method of manufacturing extruded rods of wire from compound material. 3,780,554, Cl. 72-60.000.
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Nippon Air Brake Co., Ltd., The: *See*—
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Nippon Electric Company, Limited: *See*—
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Nishi, Hiroshi H.; and McCarthy, Charles, to United States of America, Health, Education and Welfare. Vibrating pipette probe mixer. 3,780,992, Cl. 259-19.000.
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Nishijima, Yoshiaki; and Adachi, Kazutaka, to Hitachi Shipbuilding and Engineering Co., Ltd. Continuous process for producing refined sugar. 3,781,174, Cl. 127-46.00a.
Nishimura, Haruo; and Otsuka, Hideo, to Shionogi & Co., Ltd. Antibiotic tsushimycin and production thereof. 3,781,420, Cl. 424-118.000.
Nishioka, Matsuo: *See*—
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Noddin, Kenneth W.; and Simmons, Walter J., to Du Pont de Nemours, E. I., and Company. Explosively actuated valve. 3,780,752, Cl. 137-68.000.
Nolan, Frank D., 50% to Contri, Bruno. Guitar, radio, microphone combination with self-contained energy source and amplifier. 3,781,451, Cl. 84-1.160.
Nomura, Masayoshi: *See*—
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Nonaka, Shunsuke; Yuuki, Tasuku; and Hara, Kouichi, to Nippon Electric Company, Limited. Piezoelectric resonator. 3,781,577, Cl. 310-9.700.
Nonogaki, Saburo: *See*—
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Clarkin, Edward J.; and Conlee, George D., 3,780,903.
Norbeck, Dean K.; and Kimpel, Francis A., to Borg-Warner Corporation. Temperature control system for centrifugal liquid chilling machines. 3,780,532, Cl. 62-201.000.
Nortec Computer Devices Inc.: *See*—
Curtiss, Robert H.; Holzman, Richard; and Lazarow, Seldan A., 3,780,648.
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Norton, Richard V., to Sun Research and Development Co. Process for purification of naphthalene carboxylic acids. 3,781,346, Cl. 260-525.000.
Norton, Richard V., to Sun Research and Development Co. Process for purification of terephthalic acid. 3,781,347, Cl. 260-525.000.
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Nussbaum, Helmut; and Schnell, Hilmar, to Vereinigte Flugtechnische Werke-Fokker GmbH. Wing case for air foils. 3,780,969, Cl. 244-123.000.
Nussbaumer, Henri Jean, to International Business Machines Corporation. Digital data transmission system using multilevel encoding with variable dipulse spacing. 3,781,873, Cl. 340-347.0dd.
Nutten, Warren D., to Tecumseh Products Company. Self-priming carburetor. 3,780,996, Cl. 261-72.000.
O'Brien, Robert J.: *See*—
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Ochiari, Hisashi: *See*—
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Odkopaev, Boris Ivanovich; Bobkov, Alexandr Vasilievich; and Chervyakova, Ljudmila Dmitievna. Teaching machine preferably for studying foreign languages. 3,780,450, Cl. 35-9.00a.
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Ogawa, Masaya; and Seino, Kuniki, to Minolta Camera Kabushiki Kaisha. Method and apparatus for forming latent electro-static images. 3,781,108, Cl. 355-17.000.
Oguma, Masaaki; and Kurosaki, Mitsugi, to Nissan Motor Company Limited. Impact absorbing device for bumpers. 3,781,048, Cl. 293-89.000.
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Ohmura, Ryuichi. Method of making integral guide for fishing lines. 3,780,684, Cl. 113-116.0hh.
Ohta, Masachika; and Wakameda, Toshio, to Kawada Kogyo Kabushiki Kaisha. Method of fillet welding. 3,780,420, Cl. 29-471.00l.
Ohtsuka, Tetsuro: *See*—
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Oishi, Masaaki; Takahashi, Yoshinaga; and Yoshizawa, Keiichi, to Kabushiki Kaisha Hattori Tokeiten. Decimal-point printing mechanism for electronic calculator. 3,780,649, Cl. 101-93.00c.
Oka, Isao: *See*—
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Oka, Shunzo; and Nishioka, Matsuo, to Matsushita Electric Industrial Co., Ltd. Device for controlling simultaneously a plurality of variable resistors. 3,781,752, Cl. 338-128.000.
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Okazaki, Hiroshi: *See—*
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Okuda, Minoru; Aikawa, Satoru; Kaidzu, Hiromu; and Tajima, Eiichi, to Tajima Oyo Kako Co., Ltd. Method of manufacturing synthetic resin-cement products. 3,781,396, Cl. 264-140.000.
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Olsen, Willi, to Siemens Aktiengesellschaft. Electric high-tension conductor assembly. 3,781,454, Cl. 174-11.00r.
Olson, Elwyn H., to Honeywell Inc. Manual reset for a switch device. 3,781,744, Cl. 337-118.000.
Olson, Mark W.; and Silva, Walter F., to Uniroyal, Inc. Electrically heated glove with a flexible lattice heating structure. 3,781,514, Cl. 219-211.000.
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Ono, Yuichi; Saida, Hiroji; Nomura, Masayoshi; and Naraoka, Kyyotake, to Hitachi, Ltd. Method of forming a semiconductor circuit element in an isolated epitaxial layer. 3,780,426, Cl. 29-580.000.
Onuereiczuk, Sergie, to United States of America, Navy. Fluidic angular shaft position sensor. 3,780,754, Cl. 137-82.000.
Ooue, Shingo: *See—*
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Ornstein, Jacob L., to Texas Instruments, Incorporated. Arrangement for a shadow mask in a slim color television tube and thermostat metal for use therein. 3,781,583, Cl. 313-85.00s.
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Ort, Jay E., to Era Incorporated. Water reclamation-algae production. 3,780,471, Cl. 47-1.004.
Osborne, Eugene F.; and McGovern, Terrence L., to United States of America, Navy. Incremental phase shift frequency synthesizer. 3,781,706, Cl. 331-45.000.
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Outlaw, Ronald A.; Stell, Richard E.; and Hoyt, Ronald F., to United States of America, National Aeronautics and Space Administration. In situ transfer standard for ultra-high vacuum gage calibration. 3,780,563, Cl. 73-42.000.
Ovard, John C., to Ecodyne Corporation, mesne. Drift measurement system. 3,780,567, Cl. 73-28.000.
Ovens, Christopher William, to Dunhill Lighters Limited. Lighter with a capacitor discharge ignition system and means for preventing automatic recharging of said capacitor. 3,781,163, Cl. 431-266.000.
Overture, James E., 10% to Ferguson, William C. Anti-slip ladder attachment. 3,780,828, Cl. 182-111.000.
Owens, William K., to Fairchild Camera and Instrument Corporation. Temperature compensated voltage regulator having beta compensating means. 3,781,648, Cl. 323-4.000.
Owens-Illinois, Inc.: *See—*
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Uhlig, Albert R., 3,781,395.
Oxford Industries, Inc.: *See—*
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Ozaltay, H. Cevdet. Boiler. 3,780,704, Cl. 122-149.000.
Paap, Hans J.; and Tanner, Harley L., to Texaco Inc. Radioactive well logging comprising detecting unstable isotopes of aluminum. 3,781,545, Cl. 250-270.000.
Paasschens, Cornelis W. M.; and Nelson, Victor J., to Chicago Bridge & Iron Company. Spring and boss sparger-mounting. 3,781,000, Cl. 261-124.000.
Pacault, Pierre Henri; and Kagans, Marc, to Babcock & Wilcox Company, The. Direct contact evaporators. 3,780,786, Cl. 159-4.00a.
Pace, John G., to Chrysler Corporation. Marine engine cooling. 3,780,712, Cl. 123-41.080.
Packard Instrument Company, Inc.: *See—*
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Pagel, Vernon E. Cable mounted bailer for well drilling and cleaning. 3,780,804, Cl. 166-162.000.
Paige, David L. Dispensing apparatus for collapsible tube container. 3,780,911, Cl. 222-101.000.
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Pall Corporation: *See—*
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Pall, David B., to Pall Corporation. Filter comprising amisometric compressed and bonded multilayer knitted wire mesh composites. 3,780,872, Cl. 210-493.000.
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Pampus, Gottfried; Schon, Nikolaus; Witte, Josef; and Marwede, Gunter, to Bayer Aktiengesellschaft. Copolymerization of cyclopentene with polycyclic polyolefines. 3,781,257, Cl. 260-88.20d.
Panhard, Jean, to Societe de Constructions Mecaniques Panhard & Levassor. Obturating device for the intake pipe of an internal combustion engine, especially for a rotary piston engine. 3,780,706, Cl. 123-8.010.
Papai, Imre F. Pastry shell filling apparatus. 3,780,643, Cl. 99-450.700.
Papsco, William G. Low voltage power distribution system. 3,781,567, Cl. 307-147.000.
Pardoe, Carroll T.; Carlton, Alvar G.; and Appel, Robert L., to Johns Hopkins University, The. Data block multiplexing system. 3,781,818, Cl. 340-172.500.
Parilla, Arthur R. Solid propellant rocket engine control and missile configurations. 3,780,968, Cl. 244-3.220.
Parke, Davis & Company: *See—*
Colburn, Walter E.; Trowern, Howard M., Jr.; and Kerfoot, Franklin W., Jr., 3,780,907.
Parker, Rollin J., to General Electric Company. Shield for permanent magnet structure. 3,781,736, Cl. 335-304.000.
Parmett, George: *See—*
Fishman, Aaron Harry; and Parmett, George, 3,780,536.
Parr, Edward L. Visible fluid pressure indicator. 3,780,693, Cl. 116-70.000.
Partlow, William D.: *See—*
Hopkins, Richard H.; Roland, George W.; Steinbruegge, Kenneth B.; and Partlow, William D., 3,781,707.
Partridge, Ruth; and Weiss, Martin Joseph, to American Cyanamid Company. Method of inhibiting ulcerogenesis induced by non-steroidal anti-inflammatory agents. 3,781,429, Cl. 424-234.000.
Passavant, Francis C.: *See—*
Gicca, Francis A.; Passavant, Francis C.; and Worters, Allen J., 3,781,850.
Pasternak, Stephen F., to Peerless of America, Incorporated. Heat exchangers and method of making same. 3,780,799, Cl. 165-150.000.
Patin, Pierre. Three wheeled vehicles having static and dynamic equilibrium. 3,781,031, Cl. 280-62.000.
Pattberg, Werner: *See—*
Stadie, Werner; Sperling, Kurt; Deubner, Rolf; and Pattberg, Werner, 3,780,747.
Paul, Rudolf: *See—*
Klupsch, Paul; Paul, Rudolf; and Dressler, Ulrich, 3,780,636.
Pavlecka, John. Interlocked panel structure. 3,780,478, Cl. 52-206.000.
Pawellek, Dieter; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for preparing 2-aminobenzothiazole and its N-alkyl substitution products from 2-mercaptobenzothiazole. 3,781,297, Cl. 260-305.000.
Pawlitschek, Franz: *See—*

Miericke, Jurgen; Hieronymus, Hans; and Pawlitschek, Franz, 3,780,667.

Pearce, Derek Roger: *See—*
Davis, Benjamin; Pearce, Derek Roger; and Phillipps, Gordon Hanley, 3,781,435.

Pechachek, Raymond E., to Hahn & Clay. Pin-type vessel closure connector. 3,780,901, Cl. 220-46.00p.

Peek, Vernon E., to Anderson Electric Corporation. Compression connector for electrical conductors. 3,781,459, Cl. 174-94.00r.

Peerless of America, Incorporated: *See—*
Pasternak, Stephen F., 3,780,799.

Pellman, Ronald C., to Utica Cutlery Company, mesne. Device to cut or separate masses of frozen food. 3,780,436, Cl. 30-123.00r.

Penn, Alan William; and Neighbour, Frank, to United Kingdom Atomic Energy Authority. Thermoelectric units. 3,780,425, Cl. 29-573.000.

Penn, Alan William; and Beighbour, Frank, to United Kingdom Atomic Energy Authority. Thermoelectric units. 3,781,176, Cl. 136-212.000.

Pennington, John V., to Cameron Iron Works, Inc. Switch. 3,780,756, Cl. 137-119.000.

Pennwalt Corporation: *See—*
Dohany, Julius Eugene, 3,781,265.

Penquite, Charles R.: *See—*
Roth, James F.; Gambell, James W.; and Penquite, Charles R., 3,781,406.

Pentzien, Frederick R., to Kroehler Mfg. Co. Safety guard for reclining chair and the like. 3,781,060, Cl. 297-68.000.

Pepe, Anthony E.; and Singh, Hakam, to Products Research & Chemical Corporation. Halo alkoxy metal compounds. 3,781,315, Cl. 260-429.700.

Peppin, Richard A.: *See—*
Holley, John D.; and Peppin, Richard A., 3,780,664.

Perfetti, Jacques Felix Charles: *See—*
De Longueville, Jacques Charles; Perfetti, Jacques Felix Charles; and Kessler, Ernst Jakob, 3,780,658.

Perilstein, Warren L.: *See—*
Plonsker, Larry; Perilstein, Warren L.; and Malec, Robert E., 3,781,363.

Perkins, Thomas K., to Atlantic Richfield Company. Procedure for assisting renewal of oil flow in a pipeline. 3,780,749, Cl. 137-13.000.

Perkins, Thomas K., to Atlantic Richfield Company. Facilitating renewal of oil flow in a pipeline. 3,780,750, Cl. 137-13.000.

Perkis, Leib Benyaminovich: *See—*
Dolgov, Anatoly Vladimirovich; Konovalov, Leonid Vladimirovich; Perkis, Leib Benyaminovich; Deev, Stanislav Lvovich; Dyakov, Vitaly Evgenievich; Semenov, Alexandr Efimovich; Bauer, Evgeny Teodorovich; and Suturin, Serafim Nikolaevich, 3,780,864.

Perrott, Francis Cyril. Transportation. 3,780,666, Cl. 104-88.000.

Perry, Dean A. Valve with elliptical sealing. 3,780,985, Cl. 251-309.000.

Perry, William A.; and Jobst, Raymond C. Crane bucket equipment. 3,780,880, Cl. 214-1.00r.

Pertec Corporation, mesne: *See—*
Jennings, Alan K., 3,781,874.

Peschel, Stanley G., to Hipotronics, Inc. High voltage accelerator power supply. 3,781,639, Cl. 321-15.000.

Peterson, Earl A. Towing winch. 3,780,989, Cl. 254-173.00r.

Peterson, Kenneth A.: *See—*
Kuhn, Gerald D.; Peterson, Kenneth A.; Roeschlein, Eugene R.; Weiss, Donald C.; Weiss, Kenneth F.; and Zeph, David L., 3,781,776.

Petersson, Ralf Krister Ebbe; and Holmberg, Bengt Roland, to Kalmar Verstaids AB. Supporting leg structures. 3,781,035, Cl. 280-150.500.

Petri, William E., Jr.: *See—*
Lilienthal, Alfred J.; Johnson, Theodore F.; Petri, William E., Jr.; and Gilbert, Charles E., Jr., 3,780,423.

Petrikovsky, Efim Lvovich. Machine for marking cylindrical articles. 3,780,557, Cl. 72-92.000.

Petro-Tex Chemical Corporation: *See—*
Manning, Harold E., 3,781,376.

Petrov, Gueorgui Slavov: *See—*
Krivoshiev, Cueorgui Petrov; Kolev, Dimiter Christov; Tanev, Christo Yanakiev; Erinkov, Dimiter Kostadinov; Petrov, Gueorgui Slavov; Vassilev, Alexander Traykov; and Vatev, Petko Slavtchev, 3,781,554.

Pett, Edgar A.; and Kinney, Gordon. Process for the manufacture of microcrystalline fused abrasives. 3,781,172, Cl. 51-309.000.

Pettengill, Donald Herbert; and Bass, Merlyn Duane, to Deere & Company. Crop conditioner drive. 3,780,505, Cl. 56-14.400.

Pettigrew, David D.; and Vaughn, Richard. Rotary cutting blade. 3,780,780, Cl. 144-238.000.

Pettit, Marshall G. Ambulatory system. 3,780,663, Cl. 104-1.00r.

Petukhov, Arkady Demyanovich: *See—*
Lukach, Jury Efimovich; Senatos, Vladimir Alexeevich; and Petukhov, Arkady Demyanovich, 3,781,153.

Petzetakis, Aristovoulos G. Pipe and tube coupling. 3,781,041, Cl. 285-111.000.

Peyton, Keith S.; and Jolly, Michael D. Pressure activated heat absorbing or emitting detection system. 3,780,615, Cl. 89-1.00a.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,781,309.

Pfister, Alain; Arretz, Emmanuel; and Donche, Alain, to Societe Nationale des Petroles d'Aquitaine tour Aquitaine. Preparation of alpha-dithiols. 3,781,366, Cl. 260-609.00r.

Pfizer Inc.: *See—*
Carroll, Ronnie D., 3,781,277.
Lombardino, Joseph G., 3,781,294.

Pharmacia Fine Chemicals AB: *See—*
Ek, Leif V.; Wallin, Per L.; and Tibbling, Thure P. M., 3,780,866.

Phelps Dodge Industries, Inc.: *See—*
Santos, Adrian Y.; and Feder, Charles, 3,781,462.

Philco-Ford Corporation: *See—*
Houghton, Norman F., 3,781,394.

Phillipps, Gordon Hanley: *See—*
Davis, Benjamin; Pearce, Derek Roger; and Phillipps, Gordon Hanley, 3,781,435.

Phillipps, Gordon Hanley; and Turnbull, John Peter, to Glaxo Laboratories Limited. Process for preparing 3-hydroxy-9α-hydrogen-11α-hydroxy-ring a-aromatic steroids. 3,781,312, Cl. 260-397.450.

Phillips Petroleum Company: *See—*
Hsieh, Henry L., 3,781,259.
Kimbrell, William C., 3,780,516.
Mathis, Ronald D.; and Guillory, Jack P., 3,781,242.
Myers, John W., 3,781,377.
Walker, Darrell W.; Farha, Floyd E., Jr.; and Bertus, Brent J., 3,781,223.
Whitson, Bobbie L.; and Morgan, John A., 3,780,761.
Wu, Yu-Lin; and Hudson, Paul S., 3,781,341.

Phillips, William B., to International Business Machines Corporation. Web tension and speed control in a reel-to-reel web transport. 3,781,490, Cl. 179-100.20s.

Phipps, Willis M.; Holbert, Marvin L., Jr.; and McGee, John K., to Gray Tool Company. Concentric tubing hydraulic power unit, particularly for down-hole safety valve actuation. 3,780,802, Cl. 166-89.000.

Pianga, Adam: *See—*
Nickell, Claude H., 3,781,135.

Pieloth, Manfred: *See—*
Schwarz, Arnulf; Konig, Gerhard; Pieloth, Manfred; and Lang, Dietmar, 3,780,770.

Pierson, Paul Bruce, to RCA Corporation. Digitally variable delay time system. 3,781,722, Cl. 333-31.00r.

Pillnik, Burton Frank: *See—*
Holc, Henry Sylvester; and Pillnik, Burton Frank, 3,780,902.

Pines, Seemon H.: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,781,415.

Pinke, Manuel: *See—*
Nickell, Claude H., 3,781,135.

Pinnell, William R., to United States of America, Air Force. Parachute apparatus. 3,780,970, Cl. 244-152.000.

Pinter, Ladislaus: *See—*
Beriger, Ernst; and Pinter, Ladislaus, 3,781,426.
Nikles, Erwin; Dittrich, Volker; and Pinter, Ladislaus, 3,781,301.

Pipkin, Jesse E.: *See—*
Marshall, Howard D.; Gordon, Gary B.; Pipkin, Jesse E.; and Adler, Robin, 3,781,689.

Pipon, Robert: *See—*
Gobron, Georges; and Pipon, Robert, 3,781,373.

Pisani, Cesare: *See—*
Porta, Paolo Della; Zucchinelli, Mario; and Pisani, Cesare, 3,780,501.

Pitacco, Sergio, to ITT Industries, Inc. Lâmp holder. 3,781,755, Cl. 339-14.00r.

Pitzalis, Mario: *See—*
Vargiu, Silvio; and Pitzalis, Mario, 3,781,244.

Platt, Steven; and Pomeranz, Jehoshua N., to International Business Machines Corporation. Three-dimensionally-addressed memory. 3,781,828, Cl. 340-173.00r.

Plessey Handel und Investments A.G.: *See—*
Rokos, George H. S., 3,781,081.

Ploetz, Ulrich; and Thiesen, Wolfgang, to VEB Ingenieurburo Schiffbau. Apparatus for welding interrupted seams. 3,781,510, Cl. 219-130.000.

Plonsker, Larry; Perilstein, Warren L.; and Malec, Robert E., to Ethyl Corporation. Fuel and lube compositions. 3,781,363, Cl. 260-583.00p.

Podlaskin, Boris Georgievich: *See—*
Berkovskaya, Karina Fridrikhovna; Lapteva, Nina Vitalievna; and Podlaskin, Boris Georgievich, 3,781,553.

Poel, Lawrence R. Purity and blue lateral assembly for delta beam type cathode ray tube. 3,781,731, Cl. 335-212.000.

Poferl, Gunter; Schmidt, Gerald; and Smejkal, Hellmuth, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Water-cooled measuring probe for measuring the temperature of hot liquid metal baths, in particular in melting or refining furnaes. 3,780,583, Cl. 73-343.00r.

Pogoretsky, Georgy Ivanovich: *See—*
Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Dudko, Daniil Andreevich; Arkhangelsky, Georgy Alexandrovich; Pogoretsky, Georgy Ivanovich; Volgin, Leonid Alexandrovich; Kotov, Viktor Anatolievich; Surnin, Boris Anatolievich; and Degtyarev, Mikhal Vasilievich, 3,780,927.

Polcha, Raymond J., to United States of America, Navy. Wear resistant gun barrel and method of making the same. 3,780,465, Cl. 42-76.00a.

Polinski, Leon M.; and Sonn, Milton M., to Givaudan Corporation. Process for purification of hexachlorophene. 3,781,372, Cl. 260-619.00a.

Pollmann, Fritz; and Wossner, Gerhard, to Siemens Aktiengesellschaft. Electromagnetic switching device. 3,781,727, Cl. 335-132.000.

Pollution Control Systems (International) Limited: *See—*
Light, Douglas J. N., 3,780,863.

Polymer Machinery Corporation: *See—*
Frimberger, Herbert H., 3,780,446.

Polytype AG: *See—*
van der Roer, Humphrey Alphons Victor, 3,780,885.

Pomeranz, Jehoshua N.: *See—*
Platt, Steven; and Pomeranz, Jehoshua N., 3,781,828.

Pomot, Jean; and Rosenbaum, Georges, to Societe Anonyme dite: L'Oreal. Process for coloring the skin with α-dialdehydes. 3,781,418, Cl. 424-63.000.

Ponvert, Edwin K. Hemorrhoid treatment preparation produced from hot cherry peppers. 3,781,424, Cl. 424-195.000.

Pope, Hermon L., Jr.: *See—*
Morris, Marvin L., Jr.; Pope, Hermon L., Jr.; and Ruggiero, Edward M., 3,781,515.

Poppe, Martin: *See—*
Beukers, John M.; and Poppe, Martin, 3,781,893.

Poppe, Martin C., Jr.; and Friedman, Maurice, to Beukers Laboratories, Inc. Radiosonde meteorological data oscillator and pulse stretcher. 3,781,715, Cl. 332-9.00t.

Porta, Paolo Della; Zucchinelli, Mario; and Pisani, Cesare, to S.A.E.S. Getters S.p.A. Getter pumps. 3,780,501, Cl. 55-208.000.

Porter, H. K., Company, Inc.: *See—*
Weston, Donald E.; and Timmerman, Julius W., 3,780,625.

Posingies, Walter M., to Honeywell Inc. Fluidic variable capacitance network. 3,780,769, Cl. 137-819.000.

Postmaster General, Her Majesty's: *See—*
Ellen, Leonard William; and Davies, Gordon Thomas, 3,781,867.

Potter, Geoffrey, to Honeywell Information Systems, Inc. Inrush-current limiting device. 3,781,637, Cl. 321-11.000.

Poulin, Gerard: *See—*
Michaud, Treffle; Hubert, Lucien; and Poulin, Gerard, 3,780,823.

Power, Basil Dixon; Oswald, Roger Derek; and Tooth, David Michael, to British Oxygen Company Limited, The. Vacuum pumps. 3,781,518, Cl. 219-271.000.

Powers, Richard T., to AFA Corporation of Florida, The. Leakproof head for hand sprayer. 3,780,951, Cl. 239-333.000.

PPG Industries, Inc.: *See—*
DeAngelis, Willie G., 3,781,003.
Rowan, Charles M., Jr., 3,781,411.

Prange, James M., to Rockwell International Corporation. Vehicle drive system. 3,780,821, Cl. 180-44.00r.

Pregel, Alexander; and Goldman, William A., to Conrad Precision Industries. Luminous indicators involving phosphors. 3,780,462, Cl. 40-130.00r.

Preikschat, Fritz K. Impedance measuring bridge circuit. 3,781,671, Cl. 324-60.00c.

Prellwitz, Samuel B.: *See—*
Laycak, John F.; Readal, Gerald J.; and Prellwitz, Samuel B., 3,781,117.

Price, Aubrey G.: *See—*
Newcomb, Arthur L., Jr.; and Price, Aubrey G., 3,780,966.

Price, Raymond M., to United States of America, Army, mesne. Polymers containing a difluoroamino radical. 3,781,252, Cl. 260-80.730.

Primmer, Charles A., to Development Technology, Inc. Products of combustion detector. 3,781,838, Cl. 340-237.00s.

Prince, Gilles Joseph. Acoustic loading system. 3,780,824, Cl. 181-31.00b.

Prinz, Roy H.; and Kerr, Bob C., to Celanese Corporation. Stabilization of aqueous formaldehyde solutions. 3,781,365, Cl. 260-606.000.

Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Spool holder for roll film cameras. 3,780,635, Cl. 95-31.0ca.

Proctor & Gamble Company, The: *See—*
McSwiggin, James L., 3,780,850.

Proctor, Stephen G.: *See—*
Conner, William V.; and Proctor, Stephen G., 3,781,404.

Productive Aires Mfg., Co.: *See—*
Palmer, Harold S., 3,780,955.

Products Research & Chemical Corporation: *See—*
Pepe, Anthony E.; and Singh, Hakam, 3,781,315.

Programmed & Remote Systems Corporation: *See—*
Wiesener, Robert W., 3,780,571.

Propst, Robert L., to Miller, Herman, Inc. Pediatric bed. 3,780,387, Cl. 5-345.000.

Protection Devices, Inc.: *See—*
Caleskie, Vincent J.; Hughes, Paul T.; and Johnson, Robert Wayne, 3,781,789.

Proul, Donald W. Food cooking form. 3,780,978, Cl. 249-135.000.

Przybylski, Zdislaw Ryszard. Rotary internal-combustion engine. 3,780,710, Cl. 123-8.470.

Pullon, Gerald E.: *See—*
Lank, Gerald W.; and Pullon, Gerald E., 3,781,886.

Pumpen und Maschinenbau Abel Kommanditgesellschaft: *See—*
Stadie, Werner; Sperling, Kurt; Deubner, Rolf; and Pattberg, Werner, 3,780,747.

Purington, Ronald G.: *See—*
Harrison, William L.; Purington, Ronald G.; and Anderson, Donald L., 3,781,843.

Quackenbush, Edward Clarke, to Tidal Sales Corporation. Connector assembly. 3,781,762, Cl. 339-89.00c.

Quatek, Inc.: *See—*
Lester, David, 3,780,392.

Quello, Henry A., to Zimmer Manufacturing Company. Traction strip. 3,780,731, Cl. 128-169.000.

Querou, Yvon: *See—*
Chabardes, Pierre; and Querou, Yvon, 3,781,307.

Quesnel, Marcel; and Guerin, Jean, to Regie Nationale des Usines Renault and Automobiles Peugeot. Pivoting window locking devices. 3,781,044, Cl. 292-200.000.

Quilico, Adolfo: *See—*
Minisci, Francesco; Galli, Remo; and Quilico, Adolfo, 3,781,286.

Quinlan, William J.; and Hover, Lawrence L., to Hastings Manufacturing Company. Windshield wiper assembly. 3,780,394, Cl. 15-250.320.

Quinlan, William J.; and Hover, Lawrence L., to Hastings Manufacturing Company. Windshield wiper assembly. 3,780,395, Cl. 15-250.360.

Radecki, Kenneth P.: *See—*
Scott, Paul F.; Radecki, Kenneth P.; and Tatge, Robert B., 3,781,782.

Rader, Edwin R.; and Ripley, Clarence A., Jr., to Monitor Systems Corporation. Method and apparatus for non-contace surface measurement. 3,781,115, Cl. 356-167.000.

Radimer, Kenneth J.: *See—*
Munday, Theodore F.; and Radimer, Kenneth J., 3,781,409.

Radscheit, Kurt: *See—*
Haede, Werner; Stache, Ulrich; Fritsch, Werner; Radscheit, Kurt; and Lindner, Ernst, 3,781,269.

Ragard, Phillip A., to Universal Instruments Corporation. Dual in-line component socket insertion apparatus. 3,780,415, Cl. 29-203.00b.

Rahaim, Thomas J.; and Kish, Leslie G., to Westinghouse Electric Corporation. Gas turbine nozzle vane structure. 3,781,125, Cl. 415-115.000.

Rahenkamp, Robert A.: *See—*
Kolpek, Robert A.; and Rahenkamp, Robert A., 3,780,846.

Rakitch, Miodrag. AC ignition system. 3,780,717, Cl. 123-148.0ac.

Ralide, Inc.: *See—*
Nankivell, Erby Roy, Jr., 3,780,494.

Ramacheandran, Sundaresan: *See—*
Acre, Thomas R.; Gimbel, Frederick M.; and Ramacheandran, Sundaresan, 3,780,581.

Ramsey, Charles W., to General Motors Corporation. Bezel assembly. 3,781,537, Cl. 240-8.160.

Ramsey, Wallace Burton; and De Lapp, Darwin Fiske, to American Cyanamid Company. Preparation of polyglycolic acid in finely divided form. 3,781,349, Cl. 260-535.00p.

Randall, David I.; and Copes, Joseph P., to GAF Corporation. Production of 2-hydroxy-3,5,6-trichlorobenzylamines. 3,781,359, Cl. 260-570.900.

Rankin, R. Ray: *See—*
Jackson, William D. (said Jackson and Bell assors. of 10% each to), 3,780,452.

Rannells, David C., to Itek Corporation. Circuit for improving RF pulse reception frequency resolution without rise-time degradation. 3,781,688, Cl. 325-321.000.

Ransburg Electro-Coating Corporation: *See—*
Scharfenberger, James A., 3,780,942.

Ransford, Neil Edward; Gilbert, Leland Glen; and Hunger, Richard Herman, said Ransford and said Gilbert, assors. to said Deere & Company. Logging grapple. 3,781,056, Cl. 294-112.000.

Rapier, Allan Clarkson, to United Kingdom Atomic Energy Authority. Gas cooled nuclear reactors. 3,781,190, Cl. 176-59.000.

Rashkovich, Mikhail Pavlovich; Kon, Alexandr Ljudvigovich; Shaparev, Nikolai Konstantinovich; Shklovsky, Boris Isaakovich; and Leibovich, Grigory Abramovich. Method of breaking alternating-current electric motor and devices employing this method. 3,781,619 Cl. 318-211.000.

Rasmussen, Jans Ejnar. Method of vacuum investment casting. 3,780,787, Cl. 164-35.000.

Ratti, Michele. Process and device for producing fancy ply yarns with high efficiency uptwisters. 3,780,512, Cl. 57-16.000.

Rauschelbach, Paul A., to Sperry Rand Corporation. Autopilot pitch attitude control. 3,781,628, Cl. 318-584.000.

Ravas, Richard J., to Westinghouse Electric Corporation. Direction sensitive doppler processor. 3,781,773, Cl. 340-1.00r.

Raytheon Company: *See—*
Colombo, Sergio; Carugati, Vitaliano; Ferramola, Gianni; and Ferrari, Sergio, 3,781,557.
Deerfield, Alan J., 3,781,814.
Estlick, Raymond J., 3,781,042.
Harrold, William J., 3,781,592.
Monser, George J., 3,781,895.

RCA Corporation: *See—*
Arnold, Anthony Francis, 3,780,795.
Gutsogeorge, George Athan, 3,781,870.
Pierson, Paul Bruce, 3,781,722.
Ross, Edward Charles, 3,781,570.
Staras, Harold; and Shefer, Joshua, 3,781,879.
Vilkomerson, David Herman Raphael, 3,781,830.

Readal, Gerald J.: *See—*
Laycak, John F.; Readal, Gerald J.; and Prellwitz, Samuel B., 3,781,117.

Recaro GmbH. and Co.: *See—*

Walz, Jorgen; and Faust, Eberhard, 3,781,061.

Reed, Samuel F., Jr.: *See—*
Baldwin, Mart G.; and Reed, Samuel F., Jr., 3,781,178.

Reeves, John R.: *See—*
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Regie Nationale des Usines Renault: *See—*
Quesnel, Marcel; and Guerin, Jean, 3,781,044.
Rivere, Jean-Pierre, 3,780,587.

Reichardt, Peter: *See—*
Jorn, Raoul; and Reichardt, Peter, 3,781,073.

Reichert, Gilbert A.; and Moehrle, Earl R., to Allen-Bradley Company. Selector switch with particular operator means, and detents which are restrained from rotation. 3,781,499, Cl. 200-166.0sd.

Reid, Luther J., Jr.: *See—*
Suryanarayana, Yelagondahally S.; and Reid, Luther J., Jr., 3,781,287.

Reid, Philip L.: *See—*
Waldrop, Thomas E.; and Reid, Philip L., 3,780,489.

Reimer, William A., to GTE Automatic Electric Laboratories, Incorporated. Fastening device. 3,780,401, Cl. 24-16.0pb.

Reimer, William A., to GTE Automatic Electric Laboratories, Incorporated. Air directing heat sink mounting of electrical components. 3,780,798, Cl. 165-128.000.

Reimers, James L., to FMC Corporation. Container flattening apparatus. 3,780,647, Cl. 100-232.000.

Reinhard, Ruedi. Process for the manufacture of a carpet with pile that is vertically lined up in rows and with ribbon-shaped interlayers which run through part of the height of the pile and are attached to the rows of pile. 3,781,181, Cl. 156-72.000.

Reininghaus & Co., Firma: *See—*
Seelbach, Heinz, 3,781,754.

Remachandran, Karapurath: *See—*
Lilienthal, Peter Frederick, II; Remachandran, Karapurath; and Tice, Edward Stephen, 3,780,558.

Remington Arms Company, Inc.: *See—*
Munson, Harold C., 3,780,487.

Rengo Kabushiki Kaisha Rengo Co., Ltd.: *See—*
Tokuno, Masateru; and Sawada, Tetsuya, 3,780,960.

Research Corporation: *See—*
Kauzlarich, James Joseph, 3,781,071.

Research Institute, Incorporated: *See—*
Hart, Charles H.; and Cashaw, George R., 3,781,006.

Resh, Roy E., to Agridustrial Electronics, Inc. Packing adapter for testing moist chopped materials in a grain moisture tester. 3,781,673, Cl. 324-61.00r.

Rettig, Charles E., to Allis, Louis, Company, The. Adjustable frequency power supply of the inverter type. 3,781,641, Cl. 321-21.000.

Reus, Walter, to Dunlop Limited. Uniformity test machines. 3,780,573, Cl. 73-146.000.

Reuschel, Konrad: *See—*
Keller, Wolfgang; Kersting, Arno; and Reuschel, Konrad, 3,781,152.

Reuschel, Konrad; Dietze, Wolfgang; Muhlbauer, Alfred; and Sandmann, Herbert, to Siemens Aktiengesellschaft. Method of producing homogeneous rods of semiconductor material. 3,781,209, Cl. 252-62.30r.

Reynolds, Charles Edward, to AMP Incorporated. Installation tooling for plastic locking nut in strip form. 3,780,417, Cl. 29-235.000.

Reynolds, George A.: *See—*
Drexhage, Karl H.; and Reynolds, George A., 3,781,711.

Reynolds, R. J., Tobacco Company: *See—*
Ezzell, Bobby R.; Fluck, Eugene R.; and Haefele, Louis R., 3,781,444.
Neel, Robert M.; and Johnson, Robert C., 3,780,744.
Roberts, Donald L., 3,780,743.

Rhea, James W. Intubation device and method of advancing a tube past the pylorus. 3,780,740, Cl. 128-350.00r.

Rhees, Raymond C., to Kerr-McGee Chemical Corporation. Method of reducing potassium ion concentration in perchlorate solutions. 3,781,412, Cl. 423-476.000.

Rhodes, Donald W.: *See—*
Newby, Billie J.; and Rhodes, Donald W., 3,781,217.

Rhodes, John R.: *See—*
Taylor, Morris C.; and Rhodes, John R., 3,781,556.

Rhone-Poulenc S.A.: *See—*
Chabardes, Pierre; and Querour, Yvon, 3,781,307.
Julia, Marc, 3,781,313.
Nancy, Denise; and Ninet, Leon, 3,781,421.

Ribka, Joachim: *See—*
Dietz, Erich; Ribka, Joachim; and Steckelberg, Willi, 3,781,266.
Engelhardt, Friedrich; and Ribka, Joachim, 3,781,254.

Rice, Philip J., Jr., to American Express Investment Management Corporation. Hybrid electrostatic impact printer. 3,781,474, Cl. 178-25.000.

Richard Manufacturing Company: *See—*
Garnett, Robert E., 3,780,729.

Richard, Willard H. Work scheduling apparatus. 3,780,695, Cl. 116-136.000.

Richter, Mandred: *See—*
Gajer, Richard; Skurnia, Uwe; and Richter, Mandred, 3,781,397.

Rickey, Wynn P.: *See—*
Graham, John W.; and Rickey, Wynn P., 3,780,807.

Rider, George William. Surgical tubing clip clenching tool. 3,780,416, Cl. 29-212.00d.

Rieskamp, Karl: *See—*
Bunzel, Eckard; Spessert, Robert; Rieskamp, Karl; and Hildebrand, Willi, 3,781,166.

Rigassi, Norbert: *See—*
Bollag, Werner; Rigassi, Norbert; and Schwieter, Ulrich, 3,781,314.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,781,309.

Rikagaku Kenkyusho: *See—*
Kumabe, Junichiro; and Shimizu, Koichi, 3,781,022.

Riley, James Robert: *See—*
Turner, James Keith; and Riley, James Robert, 3,780,544.

Rinaldi, Fred J. Method and apparatus for acoustical shielding. 3,780,825, Cl. 181-33.00g.

Ripley, Clarence A., Jr.: *See—*
Rader, Edwin R.; and Ripley, Clarence A., Jr., 3,781,115.

Ririe, Max H.; Roland, Murray C.; and Olson, Rich, to Lockwood Corporation. Mobile irrigation apparatus and alignment control. 3,780,947, Cl. 239-177.000.

Ritchie, James Alexander. Thermal regenerators. 3,780,792, Cl. 165-9.000.

Rivelle, George R. Automatic toilet flushing system. 3,780,384, Cl. 4-41.000.

Rivere, Jean-Pierre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Methods of measuring instantaneous mean pressures in fluid media. 3,780,587, Cl. 73-398.00r.

Rivlin, Charles A.: *See—*
Hoffberger, Charles C., II; and Rivlin, Charles A., 3,781,471.

Robert, Pierre: *See—*
Derre, Andre; Robert, Pierre; and Vuillemin, Claude, 3,780,858.

Roberts, Donald L., to Reynolds, R. J., Tobacco Company. Tobacco product. 3,780,743, Cl. 131-17.000.

Roberts, Frank B., to Victor Products (Wallsend) Limited. Lamp circuits. 3,781,594, Cl. 315-98.000.

Roberts, Richard W.; and Jernakoff, George, to General Electric Company. Instrument for guiding the blind in filling open-top vessels. 3,781,840, Cl. 340-245.000.

Roberts, Robert E.; and Zdinak, William D. Programmable toy vehicle. 3,780,470, Cl. 46-213.000.

Robertshaw Controls Company: *See—*
Genbauffe, Francis S., 3,780,940.
Genbauffs, Francis S., 3,780,954.
Katchka, Jay R., 3,780,600.

Robinson, Alan Thomas. Stringed musical instruments. 3,780,612, Cl. 84-173.000.

Robinson, Eugene A., to Collins Radio Company. RF transistor carrier. 3,781,613, Cl. 317-234.00r.

Robinson, Martin A.: *See—*
Hurley, Thomas J.; and Robinson, Martin A., 3,781,321.

Robinson, Thomas Scott, to International Business Machines Corporation. Control system employing microprogram discrete logic control routines. 3,781,799, Cl. 340-164.3ma.

Robinson, William S. Apparatus for wrapping small articles. 3,780,491, Cl. 53-226.000.

Rocca-Serra, Jean: *See—*
Boudinet, Guy; and Rocca-Serra, Jean, 3,781,710.

Rocha, Henry A. F., to General Electric Company. Ultrasonic inspection apparatus. 3,780,572, Cl. 73-67.50r.

Rochat, Alain Claude: *See—*
Spaun, Ruediger; Rochat, Alain Claude; Gallay, Jean-Jacques; and Brenneisen, Paul, 3,781,290.

Rochina, Vincent: *See—*
Couchoud, Paul; and Rochina, Vincent, 3,781,400.

Rockwell International Corporation: *See—*
Nattefort, Fritz, 3,781,072.
Prange, James M., 3,780,821.
Sprague, Frederick L., 3,780,775.

Roda, Emilio, to Fratelli Roda S.A. Machine for the automatic formation and insertion of container partitions. 3,780,627, Cl. 93-37.00r.

Rodermund, Gerd: *See—*
Rodermund, Gerd; and Kappus, Helmut (said Kappus assor. to said), 3,780,514.

Rodermund, Gerd; and Kappus, Helmut, said Kappus assor. to said Rodermund, Gerd. Method for the manufacture of wreaths, pompons, rosettes, and the like. 3,780,514, Cl. 57-156.000.

Rodriguez, Edward T. Full range light dimmer adaptor. 3,781,593, Cl. 315-58.000.

Roeschlein, Eugene R.: *See—*
Kuhn, Gerald D.; Peterson, Kenneth A.; Roeschlein, Eugene R.; Weiss, Donald C.; Weiss, Kenneth F.; and Zeph, David L., 3,781,776.

Roge, Ralph R., to Wescom, Inc. Loop extender. 3,781,480, Cl. 179-16.00f.

Rogers, Dana B.: *See—*
Van Patten, Robert E.; and Rogers, Dana B., 3,780,723.

Rohm & Haas Company: *See—*
Baldwin, Mart G.; and Reed, Samuel F., Jr., 3,781,178.
Clemens, David H.; and Kunin, Robert, 3,780,500.

Rohr, Harry: *See—*
Muller, Erwin; Wirth, Wolf-Dieter; Blahak, Johannes; and Rohr, Harry, 3,781,233.

Rohr, Lewis Hampton: *See—*
Rosenthal, Francis Joseph, Jr.; and Rohr, Lewis Hampton, 3,781,579.

Rokos, George H. S., to Plessey Handel und Investments A.G. Electro-optical waveguide arrangements. 3,781,081, Cl. 350-96.0wg.

Roland, George W.: *See—*
Hopkins, Richard H.; Roland, George W.; Steinbruegge, Kenneth B.; and Partlow, William D., 3,781,707.

Roland, Murray C.: *See—*
Ririe, Max H.; Roland, Murray C.; and Olson, Rich, 3,780,947.

Rolker, John H.: *See—*
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Rollei-Werke Franke & Heidecke: *See—*
Prochnow, Claus, 3,780,635.

Rolles, Rolf: *See—*
Kondis, Thomas J.; and Rolles, Rolf, 3,781,177.

Rolls-Royce Limited: *See—*
McMurtry, David Roberts, 3,781,131.

Romell, Gunnar Vigg Riss, to Atlas Copco Aktiebolag. Hydraulic fluid actuated percussion tool. 3,780,621, Cl. 91-290.000.

Roper, Ralph E., to Wallace Expanding Machines, Inc. Container with concave belt and lock seam. 3,780,899, Cl. 220-5.00r.

Rorden, Louis H., to Develco, Inc. Magnetic detection for an anti-shoplifting system utilizing combined magnetometer and gradiometer signals. 3,781,664, Cl. 324-43.00r.

Rosano, Joseph G., Jr.; and Vaillancourt, Vincent L., to Bard, C. R., Inc. Instrument package with sterile field. 3,780,857, Cl. 206-63.200.

Rosborough, Dennis F.: *See—*
Moss, Gerald; and Rosborough, Dennis F., 3,781,445.

Rosen, Harry: *See—*
Wolf, Milton; Sellstedt, John H.; and Rosen, Harry, 3,781,300.

Rosen, Melvin Harris, to Ciba-Geigy Corporation. Methanobenzo (B) thiophenes. 3,781,293, Cl. 260-293.570.

Rosenbaum, Erik; and Martin, John Waldo, to Bendix Corporation, The. Fast time constant circuit means using time discrimination techniques. 3,781,569, Cl. 307-234.000.

Rosenbaum, Georges: *See—*
Pomot, Jean; and Rosenbaum, Georges, 3,781,418.

Rosenfeld, Daniel D.; and Gorbaty, Martin L., to Esso Research and Engineering Company. 1-Methyl-3-halomethyl-2,4-dioxo-1-3-dihydroquinazolines. 3,781,288, Cl. 260-260.000.

Rosenfeld, Howard; and Wetzler, Justin J., 1/2 to A-T-O Inc., mesne and 1/2 to American Linen Supply Co. Laundering system with soak of garments on hangers. 3,780,543, Cl. 68-18.00f.

Rosenthal, Francis Joseph, Jr.; and Rohr, Lewis Hampton, to Black and Decker Manufacturing Company, The. Protected lock means for electrically-operated hand-manipulated tools. 3,781,579, Cl. 310-68.00a.

Rosenthal, Jerome A., to Xerox Corporation. Display system. 3,781,848, Cl. 340-324.00a.

Rosner, G., & CIA, LTDA.: *See—*
Rosner, Gunther, 3,780,917.

Rosner, Gunther, to Rosner, G., & CIA, LTDA. Machine having grippers for shaping, folding and pressing collars. 3,780,917, Cl. 223-2.000.

Ross, Edward Charles, to RCA Corporation. Storage circuit using multiple condition storage elements. 3,781,570, Cl. 307-238.000.

Ross, Leonard O.; and Hill, Marion E., to United States of America, Atomic Energy Commission. Preparation of difluoronitroethylperfluoro acrylate and related compounds. 3,781,335, Cl. 260-486.00h.

Ross, Robert G.: *See—*
Baes, Charles F., Jr.; Bamberger, Carlos E.; and Ross, Robert G., 3,781,403.

Rossi, Alberto: *See—*
Jaques, Roland; and Rossi, Alberto, 3,781,267.

Roth, James F.; Gambell, James W.; and Penquite, Charles R., to Monsanto Company. Process of treating auto exhaust with shrinkage resistant copper aluminate-rare earth catalysts. 3,781,406, Cl. 423-213.000.

Roth, Robert Ingersoll, to International Business Machines Corporation. Selective shift register. 3,781,821, Cl. 340-172.500.

Roth, Willy: *See—*
Hennart, Claude; Moldovanyi, Laszlo; and Roth, Willy, 3,781,428.

Roussel-UCLAF: *See—*
Warnant, Julien; and Jolly, Jean, 3,781,311.

Rowan, Charles M., Jr., to PPG Industries, Inc. Process for the production of hydrazoic acid. 3,781,411, Cl. 423-406.000.

Rozelle, Donald S., to Magnetech Industries, Inc. Method and apparatus for transferring movable coils of a variable induction device. 3,781,738, Cl. 336-15.000.

Rubin, Alan A., to Endo Laboratories, Inc., mesne. 1,2,3,4,8,9-Hexahydro-3-methylpyrido [4',3':2,3]-indolo [1,7-ab] [1] benzazepine and the 3-ethyl homolog as tranquilizers. 3,781,437, Cl. 424-263.000.

Ruckel, Douglas J.: *See—*
Knowles, Charles R.; and Ruckel, Douglas J., 3,781,456.

Rudd, Alexander H.; Kidwell, John H.; and Murray, Thomas J., to Babcock & Wilcox Company, The. Reducing nox formation by combustion. 3,781,162, Cl. 431-115.000.

Ruggiero, Edward M.: *See—*
Morris, Marvin L., Jr.; Pope, Hermon L., Jr.; and Ruggiero, Edward M., 3,781,515.

Ruhland, John, to Xerox Corporation. Cleaning apparatus. 3,781,107, Cl. 355-15.000.

Runde, Herbert Arthur; and Kowles, Joseph Edward, to Combustion Engineering, Inc. High temperature ultrasonic transducer. 3,781,576, Cl. 310-9.100.

Ruppenthal, Wayne W. Paper storage and baling container. 3,780,854, Cl. 206-46.00r.

Rusbach, Maurice, to Sarmac S.A. Set comprising an infantry weapon and its ammunition. 3,780,616, Cl. 89-1.800.

Rushing, Frank C.; and Gilbert, Lynford W., to Westinghouse Electric Corporation. Reflector. 3,781,095, Cl. 350-310.000.

Russell, Theodore B. Mobile log-noter. 3,780,461, Cl. 40-86.000.

Russian, Ljudmila: *See—*
Shilov, Alexandr E.; Dyachkovsky, Fridrikh S.; Chirkov, Nikolai Mikhailovich; Matkovsky, Petr E.; Aronovich, Khaim-Mordkhe; Beikhold, Alina A.; and Russian, Ljudmila, 3,781,220.

Russmann, Horst: *See—*
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Ryan, Allen L.: *See—*
Williams, Norman L.; and Ryan, Allen L., 3,780,965.

Rygiol, Henry V. Method of welding employing square wave current pulses and causing the molten metal to resonate. 3,781,511, Cl. 219-137.000.

Sabel, Johann: *See—*
Balwe, Thomas; and Sabel, Johann, 3,781,255.

Sabina, William E., to Heyl & Patterson, Inc. Magnetic device for connecting hauling lines to a barge. 3,781,734, Cl. 335-289.000.

Sadee, Constant P. M.; Van Koppen, Christianus W. J.; and Koenders, Henricus A. A., to Stamicarbon N.V. Process and installation for the preparation of homo- or copolymers of ethylene. 3,781,256, Cl. 260-86.700.

Saeki, Arinori: *See—*
Miyajima, Tohru; Ichimoto, Yoshiharu; and Saeki, Arinori, 3,781,625.

S.A.E.S. Getters S.p.A.: *See—*
Porta, Paolo Della; Zucchinelli, Mario; and Pisani, Cesare, 3,780,501.

Saida, Hiroji: *See—*
Ono, Yuichi; Saida, Hiroji; Nomura, Masayoshi; and Naraoka, Kyyotake, 3,780,426.

Saint-Aubin, Georges Gilbert: *See—*
Tagarie, Frederic Louis Joseph; Bernard, Albert; and Saint-Aubin, Georges Gilbert, 3,780,617.

Saito, Susumu: *See—*
Itabashi, Yoshio; Saito, Susumu; and Seki, Masao, 3,781,245.

Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, to Toray Industries, Inc. Method of producing acrylic copolymer. 3,781,248, Cl. 260-79.00m

Sakamaki, Hiroshi, to Nippon Piston Ring Co., Ltd. Apex seal assembly of a rotary piston engine. 3,781,148, Cl. 418-117.000.

Sakamoto, Yoshio, to Hitachi, Ltd. Differential amplifier circuit. 3,781,699, Cl. 330-30.00d.

Sakurai, Mituo: *See—*
Tahara, Hisayoshi; Sakurai, Mituo; and Yamada, Hayatoshi, 3,780,937.

Salemme, Robert M.: *See—*
Ward, William J., III; and Salemme, Robert M., 3,780,496.

Salners, Edward A., to Motorola, Inc. Yoke mounting ring with deformable finger members. 3,781,730, Cl. 335-210.000.

Salomon, George Pierre Joseph. Ski attachment. 3,781,029, Cl. 280-11.350.

Saltini, Fabrizio, to Olivetti, Ing., C., & C., S.p.A. Stored program electronic computer using macroinstructions. 3,781,807, Cl. 340-172.500.

Samejima, Tadanori: *See—*
Matsumura, Hisashi; Samejima, Tadanori; Orito, Hiroshi; and Ochiari, Hisashi, 3,781,150.

Samuels, Philip Rufus, to General Electric Company Limited, The. Electrical discharge lamp. 3,781,595, Cl. 315-101.000.

Sanders Associates: *See—*
Harrison, William L.; Purington, Ronald G.; and Anderson, Donald L., 3,781,843.

Sanders Associates Inc.: *See—*
Chomet, Marc; and Ellison, Donald E., 3,781,468.
Tallman, Charles V., 3,781,779.

Sandmann, Herbert: *See—*
Reuschel, Konrad; Dietze, Wolfgang; Muhlbauer, Alfred; and Sandmann, Herbert, 3,781,209.

Sandoz-Wander, Inc.: *See—*
Galantay, Eugene E., 3,781,433.

Sandoz-Warner, Inc.: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,781,270.

Sanford, Harry W., to Thomas, James C., III. Automatic hand gun. 3,780,618, Cl. 89-150.000.

Sangamo Electric Company: *See—*
Carney, Murray C., 3,781,906.

Sanjean, John: *See—*
Cahoy, Roger P.; and Sanjean, John, 3,781,446.

Sankyo Kozaku Kogyo Kabushiki Kaisha: *See—*
Kikuchi, Junjiro, 3,781,019.

Sano, Eiichi: *See—*
Kusunoki, Yasuo; Okazaki, Hiroshi; Sato, Yoshinori; and Sano, Eiichi, 3,781,292.

Santos, Adrian Y.; and Feder, Charles, to Phelps Dodge Industries, Inc. Paper-insulated electrical conductor and method of making same. 3,781,462, Cl. 174-121.00b.

Sanz, Manuel Claude, to Micromedic Systems, Inc. Metering and dispensing apparatus. 3,780,912, Cl. 222-282.000.

Sapsowitz, Max: *See—*
Kulesza, Stanley; and Sapsowitz, Max, 3,780,659.

Saratoga Systems, Inc.: *See—*
Brown, Alvin E., 3,780,577.

Sargent Industries, Inc.: *See—*
Balthazar, Real J.; and Halberg, Richard A., 3,780,555.

Sarmac S.A.: *See—*
Rusbach, Maurice, 3,780,616.

Sasaguri, Kiichiro: *See—*
Kobayashi, Hidehiko; Sasaguri, Kiichiro; and Shiga, Masaaki, 3,781,399.

Sasaki, Toshio, to Brother Kogyo Kabushiki Kaisha. Sewing machine with a needle positioning device. 3,780,681, Cl. 112-219.00a.

Sato, Munefumi, to Nisson Motor Company, Limited. Sealing device for a rotary internal combustion engine. 3,781,147, Cl. 418-88.000.

Sato, Ryozi; and Chino, Yasuyoshi, to Nippon Zeon Co., Ltd. Process for the extraction of methacrylic acid from aqueous solutions. 3,781,332, Cl. 260-486.00r.

Sato, Toshio: *See—*
Katsumi, Mamoru; Sato, Toshio; and Hara, Tadao, 3,781,204.

Sato, Yoshinori: *See—*
Kusunoki, Yasuo; Okazaki, Hiroshi; Sato, Yoshinori; and Sano, Eiichi, 3,781,292.

Sauer, Helmut, to Siemens Aktiengesellschaft. Circuit for converting D.C. voltage into three-phase voltage. 3,781,635, Cl. 321-9.00r.

Sawada, Taketoyo: *See—*
Aizawa, Tetsuya; Sawada, Taketoyo; Tauchi, Yoshihiko; Kawamata, Tsutomu; and Saya, Hiroshi, 3,781,856.

Sawada, Tetsuya: *See—*
Tokuno, Masateru; and Sawada, Tetsuya, 3,780,960.

Sawin, Frederick C.; and Whitfill, William A., Jr., to Schlumberger Technology Corporation. Marine streamer cable. 3,781,778, Cl. 340-7.00r.

Sawyer, Walter M.: *See—*
Long, William P.; Sawyer, Walter M.; and Arias, Lionel J. De Paula, 3,780,584.

Saya, Hiroshi: *See—*
Aizawa, Tetsuya; Sawada, Taketoyo; Tauchi, Yoshihiko; Kawamata, Tsutomu; and Saya, Hiroshi, 3,781,856.

Scarpino, John J., to Hope-Tronus, Limited. Light control circuit. 3,781,604, Cl. 315-312.000.

Schack, Warren R.; and Glenn, Francis, to Swift & Company. Shaped and formed meat products manufacture. 3,780,490, Cl. 53-122.000.

Schaefer, Ernest D., to General Motors Corporation. Parking brake control mechanism. 3,780,599, Cl. 74-516.000.

Schaeffer, Gerard: *See—*
Kneller, Klaus; and Schaeffer, Gerard, 3,780,994.

Schall, Robert A., to Dorr-Oliver Incorporated. Air pressure actuated single-acting diaphragm pump. 3,781,141, Cl. 417-395.000.

Scharfenberger, James A., to Ransburg Electro-Coating Corporation. Method of dispensing a mixture of resin and expanded thermoplastic spheres. 3,780,942, Cl. 239-1.000.

Schauberger, Helmut: *See—*
Schwarzler, Peter; Bohn, Gerhard; and Schauberger, Helmut, 3,780,668.

Scheolov, Nikolai Illarionovich: *See—*
Sokolsky, Dmitry Vladimirovich; Zakumbaeva, Gaukhar Daulenovna; Zhubanov, Kair Akhmetovich; Mazin, Evgeny Petrovich; Scheolov, Nikolai Illarionovich; Fokin, Evgeny Pavlovich; and Livanov, Vladimir Arkadievich, 3,781,227.

Scherf, Gerald F.; and Kohler, Robert D., to Owens-Illinois, Inc. Apparatus and method for displaying the minimum thickness of a dielectric member measured by a radio frequency thickness gauge. 3,780,859, Cl. 209-73.000.

Schering AG: *See—*
Drawert, Manfred; and Griebsch, Eugen, 3,781,234.

Schering Corporation: *See—*
Shapiro, Elliot L.; Teutsch, George J.; and Herzog, Hershel L., 3,781,276.
Topliss, John G., 3,781,360.

Schieber, Hans; and Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Needle breakage safety device. 3,780,542, Cl. 66-165.000.

Schiesterl, Gerhard; and Kuhn, Hans-Ulrich, to Daimler-Benz Aktiengesellschaft. Vehicle liquid level monitor for passenger protection installations. 3,781,788, Cl. 340-59.000.

Schlage, Ernest L., to Schlage Lock Company. Binary multi-plane cylinder. 3,780,549, Cl. 70-358.000.

Schlage Lock Company: *See—*
Schlage, Ernest L., 3,780,549.

Schlegel Manufacturing Co. Inc., The: *See—*
Wells, Howard F., 3,781,390.

Schleicher, Harold E., to Arrow-Hart, Inc. Electrical connectors with internal and external strain-relief for conductor wires. 3,781,765, Cl. 339-103.00r.

Schlosberg, Samuel B.: *See—*
Hawthorne, John Q.; and Schlosberg, Samuel B., 3,781,352.

Schlossberg, Howard, to United States of America, Air Force. Isolator for high power laser system. 3,781,714, Cl. 331-94.500.

Schlumberger Technology Corporation: *See—*
Sawin, Frederick C.; and Whitfill, William A., Jr., 3,781,778.
Urbanosky, Harold J., 3,780,575.

Schmeykal, Rudolf: *See—*
Cramer, Bernhard; Domig, Herbert; Von Keller, Theodor; and Schmeykal, Rudolf, 3,781,800.

Schmidt, Felix Helmut: *See—*
Witt, Ernst-Christian; Stach, Kurt; Thiel, Max; Schmidt, Felix Helmut; and Stork, Harald, 3,781,328.

Schmidt, Frederick W.: *See—*
Bartoszevicz, Joseph G.; Murphy, George H., Jr.; and Schmidt, Frederick W., 3,780,409.

Schmidt, Gerald: *See—*
Poferl, Gunter; Schmidt, Gerald; and Smejkal, Hellmuth, 3,780,583.

Schneider, Eckart: *See—*
Leitz, Ludwig; Heitmann, Knut; and Schneider, Eckart, 3,781,110.

Schneider, Jos., & Co. Optische Werke: *See—*
Thomas, Otto, 3,781,617.

Schneider, Kenneth Roger, to Deere & Company. Interlock for transmission and parking brake controls. 3,780,839, Cl. 192-4.00a.

Schneider, Wilhelm: *See—*
Zimmer, Kurt; and Schneider, Wilhelm, 3,780,560.

Schneihofer, Adolf: *See—*
Holzgruber, Wolfgang; Machner, Peter; Schneihofer, Adolf; Kleinhagauer, Otmar; and Cerwenka, Peter, 3,781,448.

Schnell, Hilmar: *See—*
Nussbaum, Helmut; and Schnell, Hilmar, 3,780,969.

Scholl, Lillian L. Suspended hanger. 3,780,875, Cl. 211-115.000.

Schon, Nikolaus: *See—*
Pampus, Gottfried; Schon, Nikolaus; Witte, Josef; and Marwede, Gunter, 3,781,257.

Schott, Robert E.: *See—*
Matthews, Ralph W.; and Schott, Robert E., 3,780,762.

Schreiner, Horst; and Fidos, Henryk, to Siemens Aktiengesellschaft. Wire plating apparatus including doctoring die. 3,780,698, Cl. 118-125.000.

Schrewelius, Nils Gustav, to Bulten-Kanthal Aktiebolag. Heat resistant, electrical insulating heating unit. 3,781,528, Cl. 219-546.000.

Schubert, Hans-Werner; and Hoffmeister, Friedrich, to Bayer Aktiengesellschaft. Benzomorphan derivatives with analgesic agents. 3,781,431, Cl. 424-267.000.

Schulman, Norman S. Monochromatic photographic exposure process and apparatus. 3,780,631, Cl. 95-10.00c.

Schultz, Matthew; and Schultz, William L. Bead breaker and tire removal and replacement device. 3,780,785, Cl. 157-1.240.

Schultz, William L.: *See—*
Schultz, Matthew; and Schultz, William L., 3,780,785.

Schumacher, Henning: *See—*
Ellinger, Karl-Georg; and Schumacher, Henning, 3,781,416.

Schumacher, Walter C.; and Graves, Ralph L., to General Electric Company. Mercury switch with heat sink contact. 3,781,502, Cl. 200-226.000.

Schuss, Jack Ascher, to Combustion Engineering, Inc. Control logic test circuit. 3,781,161, Cl. 431-16.000.

Schwab, Delmar G.; and Graham, Dennis P., to Hyster Company. Hydrostatic auxiliary wheel motor assist drive system for vehicles. 3,780,820, Cl. 180-44.00m.

Schwartz, Albert B., to Mobil Oil Corporation. Treatment of colloidal zeolites. 3,781,225, Cl. 252-455.00z.

Schwartz, Albert B., to Mobil Oil Corporation. Treatment of colloidal zeolites. 3,781,226, Cl. 252-455.00z.

Schwarz, Arnulf; Konig, Gerhard; Pieloth, Manfred; and Lang, Dietmar, to VEB Reglerwerk Dresden. Multiple input fluidic jet element for a fluidic circuit. 3,780,770, Cl. 137-823.000.

Schwarzler, Peter; Bohn, Gerhard; and Schauberger, Helmut, to Krauss-Maffei AG. Electromagnetic suspension and/or guide system especially for magnetically suspended vehicles. 3,780,668, Cl. 104-148.0ms.

Schweitzer, E. O., Manufacturing Co., Inc.: *See—*
Schweitzer, Edmund O., Jr., 3,781,682.

Schweitzer, Edmund O., Jr., to Schweitzer, E. O., Manufacturing Co., Inc. Resettable fault indicating means having a ringlike magnetic circuit. 3,781,682, Cl. 324-133.000.

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Kneller, Klaus; and Schaeffer, Gerard, 3,780,994.

Schwieter, Ulrich: *See—*
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Scott, Paul F.; Radecki, Kenneth P.; and Tatge, Robert B., to General Electric Company. Directive acoustic array for noise source localization. 3,781,782, Cl. 340-16.00r.

Scudder, Philmore M.; and Warren, Robert W., to Sun Research and Development Co., mesne. Method of preparing 2,4-dimethylisophthalic acid. 3,781,345, Cl. 260-524.00r.

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Searle, G. D., & Co.: *See—*
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Seelbach, Heinz, to Rehinghaus & Co., Firma. Lighting device. 3,781,754, Cl. 339-14.00r.
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Seiko Koki Kabushiki Kaisha: *See—*
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Sellman, Paul V.; Dingman, S. Lawrence; and Atkins, Ronald T., to United States of America, Army. Measurement of the total volume flow of a watercourse. 3,780,578, Cl. 73-227.000.
Sellstedt, John H.: *See—*
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Sennewald, Kurt; Erpenbach, Heinz; Handte, Heinz; Kohl, Georg; and Lork, Winfried, to Knapsack Aktiengesellschaft. Process for isolating acrylic acid from aqueous crude acrylic acid by distillations with 3,3,5-trimethycyclohexamone and thin layer evaporatin. 3,781,193, Cl. 203-8.000.
Serkh, Mikhail Borisovich: *See—*
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Shaffer, William E.; and Krawczyk, Charles C., to Stromberg-Carlson Corporation. Amplifier select and control circuit. 3,781,481, Cl. 179-16.00f.
Shaparev, Nikolai Konstantinovich: *See—*
Rashkovich, Mikhail Pavlovich; Kon, Alexandr Ljudvigovich; Shaparev, Nikolai Konstantinovich; Shklovsky, Boris Isaakovich; and Leibovich, Grigory Abramovich, 3,781,619.
Shapiro, Elliot L.; Teutsch, George J.; and Herzog, Hershel L., to Schering Corporation. 6-Azido-6-dehydro steroids of the progesterone series, methods for their manufacture and intermediates produced thereby. 3,781,276, Cl. 260-239.550.
Shapland, James T., to United States Steel Corporation. Rotary gate for bottom pour vessel having removable nozzles. 3,780,916, Cl. 222-555.000.
Sharp, Paul H., to Columbia Broadcasting System, Inc. Counterbalanced two speaker rotary tremolo device. 3,781,475, Cl. 179-1.00j.
Shavrin, Adolf Ivanovich: *See—*
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich, 3,780,428.
Shear, Wayne G.; Spratt, Brendan J.; and McClure, Benton J., to Bendix Corporation, The. Collision avoidance system ground station synchronization. 3,781,803, Cl. 340-147.0sy.
Shefer, Joshua: *See—*
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Sheller-Globe Corporation: *See—*
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Shim, Ivan H.; and Stelben, John J., to United States of America, National Aeronautics and Space Administration. Recorder/processor apparatus. 3,781,902, Cl. 346-24.000.
Shima, Takeo; Orsaki, Takanori; Oka, Isao; and Funakoshi, Wataru, to Teijin Limited. Process for preparation of 1,5-dimethyl naphthalene and/or 1,6-dimethyl naphthalene and catalyst composition to be used for said process. 3,781,375, Cl. 260-668.00d.
Shimada, Tsuneo: *See—*
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Shimizu, Koichi: *See—*
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Shimizu, Ryozi; Nakao, Kenji; Oguri, Masaaki; and Ohgaki, Masakatu, to OKI Electric Industry Co., Ltd. and Taiser Corporation. Remote detonation system. 3,780,654, Cl. 102-22.000.
Shimoda, Keitaro; Kuratani, Keijiro; and Sugiura, Akira, to American Cyanamid Company. Method for producing acrylic hollow fibers. 3,781,391, Cl. 264-53.000.
Shionogi & Co., Ltd.: *See—*
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Shirn, George A., to Sprague Electric Company. Apparatus for stripping brittle wire insulation. 3,780,928, Cl. 228-13.000.
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Short, Joe T., to Deering Milliken Research Corporation. Process and apparatus for the production of tufted pile fabrics. 3,780,678, Cl. 112-79.00a.
Shuey, Kenneth C.; and Baker, Donald E., to Westinghouse Electronic Corporation. AC power control apparatus with demand responsive driver circuit. 3,781,572, Cl. 307-252.00t.
Shuffield, Jack E., to C & W Sewing Machine. Belt-loop feeder, and strip cutter. 3,780,680, Cl. 112-121.270.
Shukoff, Walter: *See—*
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Siddall, John B.: *See—*
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Siddall, John B., to Zoeton Corporation. Preparation of 5-benzyl-3-furylmethanol. 3,781,308, Cl. 260-347.800.
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, to Ciba-Geigy AG. Novel p-phenylstilbyl heterocyclic and naphthyl-vinylpenylene heterocyclic optical brighteners. 3,781,278, Cl. 260-240.0ca.
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Keller, Wolfgang; Kersting, Arno; and Reuschel, Konrad, 3,781,152.
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Silva, Albert J. Automatic display racks. 3,780,873, Cl. 211-49.00d.
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Simorghi, Parviz. Separable key-head and filing system. 3,780,550, Cl. 70-395.000.
Simplicity Manufacturing Company Inc.: *See—*
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Singer Company, The: *See—*
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Singh, Jag J., to United States of America, National Aeronautics and Space Administration. Mossbauer spectrometer radiation detector. 3,781,562, Cl. 250-360.000.
Singh, Shanker, to International Business Machines Corporation. Test pattern generator. 3,781,829, Cl. 340-173.00r.
Sipe, Therell L., to General Motors Corporation. Grinding wheel and mounting assembly. 3,780,476, Cl. 51-168.000.
Sjoberg, Berndt Olof Harald: *See—*

Carlsson, Lars Anders Fritz; Helgstrand, John Erik; Sjoberg, Berndt Olof Harald; and Stjernstrom, Nils Erik, 3,781,280.

Skaggs, Richard, 20% to Lee, Raymond, Organization, Inc. Automated conveyor system. 3,780,414, Cl. 29-200.00a.

Skamra, Dale William, to Xerox Corporation. Fuser thermal protector. 3,781,517, Cl. 219-216.000.

Skuin, Petar: *See*—
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Slan, Jack, to Dominion Luggage Co., Limited. Luggage case. 3,780,838, Cl. 190-49.000.

Slane, Gary R. Gravity projector batted ball apparatus. 3,781,012, Cl. 273-95.00r.

Sletzinger, Meyer: *See*—
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,781,415.

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Smillie, Winston B., to Townsend and Townsend. Aerosol enzyme detergents stabilized with carbon dioxide. 3,781,212, Cl. 252-89.000.

Smith, Allan L.; and Bowen, James G. Self-cleaning emitter. 3,780,946, Cl. 239-107.000.

Smith, Frank: *See*—
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Smith, Jay R. Installation gauge or the like. 3,780,443, Cl. 33-180.00a.

Smith, John: *See*—
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Smith, Joseph L., Jr.; Thullen, Philip; and Kirtley, James L., Jr., to Massachusetts Institute of Technology. Stator structure for electrical machine. 3,781,578, Cl. 310-52.000.

Smith, Kenneth Burton; and Gladstone, Shaul, to Argus Chemical Corporation mesne. Apparatus for continuously monitoring air-pollution. 3,780,566, Cl. 73-23.000.

Smith Kline Instruments, Inc.: *See*—
Goldberg, Paul R., 3,780,725.

Smith, Nicholas Kimbrough, to Bell Telephone Laboratories, Incorporated. Error detecting translator. 3,781,796, Cl. 340-146.1ae.

Smith, Robert L.; and Smith, William O. Bit construction for smoking pipes. 3,780,745, Cl. 131-212.00a.

Smith, William E.: *See*—
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Smith, William E.; Orlando, Charles M.; and Barito, Robert W., to General Electric Company. Storage stable premix for production of polyurethane foam. 3,781,229, Cl. 260-2.5be.

Smith, William O.: *See*—
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Soames, Michael Richard, to Image Analysing Computers Limited. Method and apparatus for measuring the length of elongate features having a substantially common orientation employing line scanning. 3,781,467, Cl. 178-6.800.

Sobolev, Jury Vasilievich: *See*—
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Societe de Constructions Mecaniques Panhard & Levassor: *See*—
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Societe d'Etudes Recherches et Constructions Electroniques (S.E.R.C.E.L.): *See*—
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Societe Francaise d'Optique et de Mecanique S.F.O.Mo.: *See*—
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Societe Generale de Constructions Electriques et Mecaniques (Alsthom): *See*—
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Societe Italiana Telecommunicazioni Siemens S.p.A.: *See*—
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Societe Lannionnaise d'Electronique: *See*—
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Societe Nationale des Petroles d'Aquitaine tour Aquitaine: *See*—
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Societe Rhodiaceta: *See*—
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Sodersten, Bo Frans Ake: *See*—
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Soderstrom, Hans Sture, to Trelleborgs Gummifabriks Aktiebolag. Filling and emptying valve. 3,780,768, Cl. 137-625.480.

Sofie, Walter F.: *See*—
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Sommer, Lothar: *See*—
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Spaun, Ruediger; Rochat, Alain Claude; Gallay, Jean-Jacques; and Brenneisen, Paul, to Ciba-Geigy Corporation. Phenoxyphenyl phenylthiophenyl and phenylaminophenyl piperazinylthioureas. 3,781,290, Cl. 260-268.00c.

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Spencer, Jacob H., to Nortech Laboratories, Inc. Device for use as a hot and cold compress. 3,780,537, Cl. 62-530.000.

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Spier, Carl P., to United States of America, Air Force. Expandable tire retainer assembly. 3,780,784, Cl. 157-1.000.

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Splingaerd, John Peter. Safety switch with hinge type interlocking mechanism for operating switch contacts or preventing actuation thereof. 3,781,495, Cl. 200-50.00a.

Sprague Electric Company: *See*—
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Sprague, Frederick L., to Rockwell International Corporation. Weft control mechanism for shuttleless looms. 3,780,775, Cl. 139-122.000.

Spratt, Brendan J.: *See*—
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Stache, Ulrich: *See*—
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Stacy, Hershel, Sr. Utility tree. 3,780,874, Cl. 211-65.000.

Stader, Richard O. Walking device. 3,780,728, Cl. 128-83.500.

Stadie, Werner; Sperling, Kurt; Deubner, Rolf; and Pattberg, Werner, to Pumpen und Maschinenbau Abel Kommanditgesellschaft. Apparatus for cleaning filter plates and the like. 3,780,747, Cl. 134-43.000.

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Standard Oil Company: *See—*
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Stanford, Charles O., to Fedders Corporation. Pressure compensating door catch assembly. 3,780,904, Cl. 220-55.300.

Stange, Karl; Jenne, Helmut; and Koenig, Ulrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Laminates of styrene polymers and polyphenylene oxide. 3,781,186, Cl. 161-253.000.

Stanislavsky, Lazar Yankelevich: *See—*
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Staples, Crawford E., to Westinghouse Air Brake Company. Jointless coded alternating current track circuits. 3,781,540, Cl. 246-34.0ct.

Staples, Crawford E.; and Stark, Donald E., to Westinghouse Air Brake Company. Highway crossing protection apparatus. 3,781,543, Cl. 246-130.000.

Staras, Harold; and Shefer, Joshua, to RCA Corporation. Harmonic radar detecting and ranging system for automotive vehicle. 3,781,879, Cl. 343-5.00r.

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Staskiewicz, Fred C.; and Fromson, Robert E. Apparatus for conditioning continuously cast bars. 3,780,552, Cl. 72-40.000.

Staub, Bernard. Food table. 3,780,794, Cl. 165-58.000.

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Stehlin, Robert A.; Spence, Hilton W.; and Matzen, Walter T., to United States of America, Air Force. Differential method of photocurrent measurement. 3,781,680, Cl. 324-123.00r.

Steigerwald, Robert L., to General Electric Company. Constant duty cycle control of induction cooking inverter. 3,781,505, Cl. 219-10.490.

Steinbruegge, Kenneth B.: *See—*
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Steiner, H., Limited: *See—*
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Stelben, John J.: *See—*
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Stell, Richard E.: *See—*
Outlaw, Ronald A.; Stell, Richard E.; and Hoyt, Ronald F., 3,780,563.

Stelling, William. Retractable water jet for a water jet/steering and propulsion system. 3,780,691, Cl. 115-12.00r.

Stendig, Joseph L.; and Davis, Claude A. Condition responsive receptacles. 3,781,857, Cl. 340-420.000.

Stepan Chemical Company: *See—*
Fischer, Elias, 3,780,860.

Stephenson, John Edward. Research teaching tool. 3,780,449, Cl. 35-1.000.

Stephenson, Michael J.: *See—*
Anderson, Lowell W.; and Stephenson, Michael J., 3,781,392.

Stephenson, Robert L.; and Loomba, Yogendra S., to Allied Chemical Corporation. Seat belt buckle plunger type switch and housing containing belt latch mechanism. 3,781,497, Cl. 200-61.58b.

Sterling Drug Inc.: *See—*
Crounse, Nathan N.; and Desai, Kantilal B., 3,781,279.
Langstroth, Theodore A., 3,781,215.

Sternbach, Leo Henryk: *See—*
Ning, Robert Ye-Fong; and Sternbach, Leo Henryk, 3,781,353.

Sterwin A.G.: *See—*
Ellinger, Karl-Georg; and Schumacher, Henning, 3,781,416.

Steven Manufacturing Co.: *See—*
Taylor, Beverly W., 3,781,027.

Stevenson, William L.; and Vertanen, George J., to Simplicity Manufacturing Company Inc. Snowblower discharge spout with air-inlet means. 3,780,455, Cl. 37-43.00r.

Stewart, Hugh W.: *See—*
Coleman, Aaron H.; and Stewart, Hugh W., 3,781,816.

Stinchcomb, Raymond G., to United States of America, Army. Seismic inhibit circuit for RF mine sensor. 3,780,653, Cl. 102-19.200.

Stjernstrom, Nils Erik: *See—*
Carlsson, Lars Anders Fritz; Helgstrand, John Erik; Sioberg, Berndt Olof Harald; and Stjernstrom, Nils Erik, 3,781,280.

Stobb, Anton R.; and Stobb, Walter J. Sheet stacker. 3,781,005, Cl. 271-186.000.

Stobb, Walter J.: *See—*
Stobb, Anton R.; and Stobb, Walter J., 3,781,005.

Stockdale, Willis L.: *See—*
Bloemendaal, John F.; and Stockdale, Willis L., 3,780,922.

Stoeck, Paul F.: *See—*
Ziolko, Walter; and Stoeck, Paul F., 3,781,058.

Stone, Wayne B., Jr.: *See—*
Cupler, John A., II; and Stone, Wayne B., Jr., 3,780,406.

Stoneham, Jeffrey R.: *See—*
Kamp, Leonard F.; and Stoneham, Jeffrey R., 3,780,632.

Stork, Harald: *See—*
Witt, Ernst-Christian; Stach, Kurt; Thiel, Max; Schmidt, Felix Helmut; and Stork, Harald, 3,781,328.

Storti, Giancarlo. Ribbon-type composite sawing device. 3,780,609, Cl. 83-420.000.

Story Chemical Corporation: *See—*
Story, Paul R.; and Busch, Peter, 3,781,303.

Story, Paul R.; and Busch, Peter, to Story Chemical Corporation. Method of preparing tricyclohexylidene peroxide. 3,781,303, Cl. 260-338.000.

Stout, Charles R.: *See—*
Judd, Gordon W.; and Stout, Charles R., 3,781,721.

Straight, David M., to United States of America, National Aeronautics and Space Administration. Gas turbine exhaust nozzle. 3,780,827, Cl. 181-43.000.

Stromberg-Carlson Corporation: *See—*
Shaffer, William E.; and Krawczyk, Charles C., 3,781,481.

Studeny, Henry G., to Western Electric Company, Incorporated. Article transferring mechanism. 3,780,848, Cl. 198-25.000.

Styczynski, Robert J., to United States of America, Army. Rifling lands inspection gage. 3,780,438, Cl. 33-174.00r.

Styring, Ralph E., Jr., to Atlantic Richfield Company. Restoring oil flow in a pipeline. 3,780,751, Cl. 137-13.000.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,781,309.

Sudnick, Dennis J.; and Shutts, Robert L., to Inservco, Inc. Transducer amplifier with automatic balance. 3,781,869, Cl. 340-347.0cc.

Sudo, Tsuneta: *See—*
Mizushima, Yoshihiko; and Sudo, Tsuneta, 3,781,806.

Sugawara, Yoshiaki: *See—*
Izawa, Shinichi; Toyama, Kunio; Harada, Kazuhiko; and Sugawara, Yoshiaki, 3,781,382.

Sugiura, Akira: *See—*
Shimoda, Keitaro; Kuratani, Keijiro; and Sugiura, Akira, 3,781,391.

Sugiyama, Uichiro. Tire pressure detecting apparatus. 3,781,787, Cl. 340-58.000.

Sulger, Harold, Sr., to Dynamic Instrument Corporation. Pressure transducer. 3,781,751, Cl. 338-42.000.

Sullivan, Daniel David, to Bell Telephone Laboratories, Incorporated. Method and apparatus for decoding BCH codes. 3,781,791, Cl. 340-146.1al.

Sulzbach, Reinhard A.; and Iqbal, Abul F. M. Silylated 1,4-dihydropyridines. 3,781,291, Cl. 260-290.00h.

Sulzer Brothers Limited: *See—*
De Vivy, Dominque Le Febve, 3,780,705.

Sumita, Haruki, to Minolta Camera Kabushiki Kaisha. Four layer anti-reflection coating. 3,781,090, Cl. 350-164.000.

Sumitomo Chemical Company, Ltd.: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Akatsu, Mitsuihiro; Maruyama, Isamo; and Izumi, Takahiro, 3,781,299.

Sumitomo Electric Industries, Limited: *See—*
Nakahara, Tsuneo; Kurauchi, Noritaka; Kitani, Hiroshi; Takemura, Kenji; and Kuroda, Masataka, 3,781,687.

Sumitomo Electric Industries, Ltd.: *See—*
Yoshida, Kenichi; and Miyamoto, Yoshio, 3,781,725.

Sun Oil Company (Delaware): *See—*
Hardy, William C.; and Lichte, Henry P., Jr., 3,780,803.

Sun Oil Company of Pennsylvania: *See—*
Thompson, Sheldon L., 3,781,196.

Sun Research and Development Co.: *See—*
Davis, Ronald I., 3,781,298.
Norton, Richard V., 3,781,343.
Norton, Richard V., 3,781,346.
Norton, Richard V., 3,781,347.
Talbot, Alfred F., 3,781,371.
Wynkoop, Raymond; and Kohn, Edward M., 3,781,198.

Sun Research and Development Co., mesne: *See—*
Scudder, Philmore M.; and Warren, Robert W., 3,781,345.

Sundeen, Arthur R.: *See—*
Coleman, Richard J.; Foster, David J.; Loper, Edward J., Jr.; and Sundeen, Arthur R., 3,780,593.

Sundermann, Henry L. Brake for farm wagon. 3,780,833, Cl. 188-9.000.

Sundy, George J., to Bethlehem Steel Corporation. Method for continuously casting steel using a partially coated refactory nozzle. 3,780,788, Cl. 164-82.000.

Surko, Walter E., Jr., to Emhart Corporation. Adjustabel support. 3,781,047, Cl. 292-251.500.

Surnin, Boris Anatolievich: *See—*
Kudinov, Vladimir Mikhailovich; Bushtedt, Jury Petrovich; Dudko, Daniil Andreevich; Arkhangelsky, Georgy Alexandrovich; Pogoretsky, Georgy Ivanovich; Volgin, Leonid Alexandrovich; Kotov, Viktor Anatolievich; Surnin, Boris Anatolievich; and Degtyarev, Mikhal Vasiievich, 3,780,927.

Suryanarayana, Yelagondahally S.; and Reid, Luther J., Jr., to Ciba-Geigy Corporation. Process for the regeneration of deactivated carbon catalyst. 3,781,287, Cl. 260-248.00c.

Sussman, Arthur: *See—*
Sussman, David L.; and Sussman, Arthur, 3,781,092.

Sussman, David L.; and Sussman, Arthur. Monitoring system. 3,781,092, Cl. 350-266.000.

Sutco, Inc.: *See—*
Hollier, Joseph H., Jr., 3,780,626.

Sutton, Blaine M.: *See—*
Berkoff, Charles E.; Sutton, Blaine M.; and Walz, Donald T., 3,781,434.

Sutton, Blaine M., to Smithkline Corporation. Pyridyl ketipate lactones and derivatives. 3,781,295, Cl. 260-295.00r.

Suturin, Serafim Nikolaevich: *See—*
Dolgov, Anatoly Vladimirovich; Konovalov, Leonid Vladimirovich; Perkis, Leib Benyaminovich; Deev, Stanislav Lvovich; Dyakov, Vitaly Evgenievich; Semenov, Alexandr Efimovich; Bauer, Evgeny Teodorovich; and Suturin, Serafim Nikolaevich, 3,780,864.

Suzuki, Horoshi; and Tsutsui, Yoshiro, to Industrial Science and Technology, Agency of. Hydroxy-fatty acid amide polyoxyalkylene ether: soap compositions. 3,781,218, Cl. 252-356.000.

Suzuki, Takeshi: *See—*
Kometani, Yutaka; Koizumi, Shun; Suzuki, Takeshi; Nakajima, Takeaki; and Okuno, Chuzo, 3,781,258.

Suzuki, Zennosuke: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.

Swain, Kenneth W.: *See—*
DiMarco, Bernard; Kussy, Frank W.; and Swain, Kenneth W., 3,781,607.

Swain, William W.; and Hathaway, Richard A., to Avco Corporation, mesne. Reel-over-reel video tape cartridge and transport apparatus with sliding pivot. 3,781,487, Cl. 179-100.2oz.

Swatty, Eugene E., to Fluid Controls, Inc. Restrictive flow regulating valve and control circuit employing same. 3,780,765, Cl. 137-613.000.

Sweeney, Richard F.: *See—*
Anello, Louis G.; Sweeney, Richard F.; and Litt, Morton H., 3,781,370.

Swet, Charles J., to United States of America, Navy. Fiber optical solar collector. 3,780,722, Cl. 126-270.000.

Swift & Company: *See—*
Schack, Warren R.; and Glenn, Francis, 3,780,490.

Swiss Aluminium, Ltd.: *See—*
Unger, Manfred, 3,780,789.

Swoboda, Maxmillian Augustus, 1/3 to Lahr, Jack L. and 1/3 to Benson, Jack M. Method and apparatus for transmitting time compressed audio information. 3,781,479, Cl. 179-15.55t.

Sybron Corporation: *See—*
Faessler, Adelmar; and Engle, Stewart E., 3,780,847.

Sykora, Josef, to Celanese Canada Limited. Light rigid mandrel able to engage paper or fibre tubes. 3,780,962, Cl. 242-72.000.

Systron Donner Corporation: *See—*
Voyles, Richard E.; and Giles, William A., 3,781,678.

Szabo, Georges: *See—*
Weisang, Joseph Edouard; Szabo, Georges; and Maurin, Jean, 3,781,222.

Tac House, Inc.: *See—*
Cvijanovic, Alex; and Firnkas, Sepp, 3,780,480.

Tadokoro, Kinya, to Kabushiki Kaisha Sunpak. Electronic flash circuits. 3,781,602, Cl. 315-241.00p.

Taft, Philip Augustus, to Girling Limited. Brake control apparatus. 3,781,064, Cl. 303-21.00f.

Tagarie, Frederic Louis Joseph; Bernard, Albert; and Saint-Aubin, Georges Gilbert, to Etat Francais represente Par Le Ministre Charge de la Defense Nationale Delegation. Device for breaking a launching rack-to-missile umbilical cord. 3,780,617, Cl. 89-1.81.

Taguchi, Masayoshi: *See—*
Chono, Masazumi; Nakajima, Hitoshi; Taguchi, Masayoshi; and Matsuo, Noriaki, 3,781,336.

Tahara, Hisayoshi; Sakurai, Mituo; and Yamada, Hayatoshi, to Tokyo Shibaura Electric Company, Ltd. Centrifugal gas separator with electric motor drive. 3,780,937, Cl. 233-24.000.

Taiser Corporation: *See—*
Shimizu, Ryozi; Nakao, Kenji; Oguri, Masaaki; and Ohgaki, Masakatu, 3,780,654.

Tajima, Eiichi: *See—*
Okuda, Minoru; Aikawa, Satoru; Kaidzu, Hiromu; and Tajima, Eiichi, 3,781,396.

Tajima Oyo Kako Co., Ltd.: *See—*
Okuda, Minoru; Aikawa, Satoru; Kaidzu, Hiromu; and Tajima, Eiichi, 3,781,396.

Takabayashi, Teruo, to Karin Limited. Plastic clip. 3,780,402, Cl. 24-250.0he.

Takagi, Makoto: *See—*
Matsuda, Tsutomu; and Takagi, Makoto, 3,780,755.

Takahashi, Sasuke. Device for the fixing, being combined with slow lowering, of the sliding pole of a portable motion picture screen stand. 3,780,974, Cl. 248-411.000.

Takahashi, Seihachi; Katayama, Nobuaki; and Morino, Hideki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Floating support for the shift lever in a shift assembly for a transmission. 3,780,596, Cl. 74-473.00p.

Takahashi, Shiro: *See—*
Nemoto, Yuhei; and Takahashi, Shiro, 3,781,214.

Takahashi, Yoshinaga: *See—*
Oishi, Masaaki; Takahashi, Yoshinaga; and Yoshizawa, Keiichi, 3,780,649.

Takahashi, Yukiharu: *See—*
Kubo, Moritada; and Takahashi, Yukiharu, 3,781,626.

Takamatsu, Hideaki; Murashima, Noboru; and Nishihira, Koichi, to Industrial Science & Technology, Agency of and Bando Chemical Industries, Ltd. Metal and chloroprene rubber composite material. 3,781,185, Cl. 161-217.000.

Takeda Chemical Industries, Ltd.: *See—*
Aoki, Katsuo; Yatani, Kozo; Kometani, Eishi; and Izuhara, Seiji, 3,781,423.

Takemura, Kenji: *See—*
Nakahara, Tsuneo; Kurauchi, Noritaka; Kitani, Hiroshi; Takemura, Kenji; and Kuroda, Masataka, 3,781,687.

Takiguchi, Hisashi, to Denki Onkyo Co., Ltd. Galvano-magnetro effect device. 3,781,750, Cl. 338-32.00r.

Talbot, Alfred F., to Sun Research and Development Co. 2-Adamantyl- and 2,6-diadamantyl-p-cresols. 3,781,371, Cl. 260-619.00d.

Tall, Wayne A., to United States of America, Air Force. Turbine blade manufactured of self-carrying laminates. 3,781,130, Cl. 416-97.000.

Tallman, Charles V., to Sanders Associates, Inc. Gas impermeable expansion diaphragm. 3,781,779, Cl. 340-8.00r.

Talmon, Omri: *See—*
Kamil, Zvi; Amir, Yoel; and Talmon, Omri, 3,781,498.

Tamai, Akira: *See—*
Kitamura, Tetsuo; and Tamai, Akira, 3,780,619.

Tamm, Richard F., to Continental Can Company, Inc. Developer mixture for electrostatic printing. 3,781,207, Cl. 252-62.100.

Tanev, Christo Yanakiev: *See—*
Krivoshiev, Cucorgui Petrov; Kolev, Dimiter Christov; Tanev, Christo Yanakiev; Erinkov, Dimiter Kostadinov; Petrov, Gucorgui Slavov; Vassilev, Alexander Traykov; and Vatev, Petko Slavtchev, 3,781,554.

Tanner, Harley L.: *See—*
Paap, Hans J.; and Tanner, Harley L., 3,781,545.

Tashiro, Donald K., to International Harvester Company. Harvester drive system. 3,780,506, Cl. 56-14.000.

Tashiro, Donald K., to International Harvester Company. Harvester platform suspension. 3,780,508, Cl. 56-208.000.

Tatge, Robert B.: *See—*
Scott, Paul F.; Radecki, Kenneth P.; and Tatge, Robert B., 3,781,782.

Tauchi, Yoshihiko: *See—*
Aizawa, Tetsuya; Sawada, Taketoyo; Tauchi, Yoshihiko; Kawamata, Tsutomu; and Saya, Hiroshi, 3,781,856.

Taylor, Beverly W., to Steven Manufacturing Co. Self biasing roller skate. 3,781,027, Cl. 280-11.260.

Taylor, Edward I., Jr.: *See—*
Jentsch, Alfred C., Jr.; Taylor, Edward I., Jr.; and Shukoff, Walter, 3,780,606.

Taylor, James L., to Ideal Aerosmith, Inc., mesne. Measuring instrument. 3,780,440, Cl. 33-139.000.

Taylor, Marvin, to AMBAC Industries, Incorporated. Gyrocompass. 3,780,444, Cl. 33-327.000.

Taylor, Morris C.; and Rhodes, John R., to United States of America, Atomic Energy Commission. Neutron activation analysis system. 3,781,556, Cl. 250-302.000.

Teach, Eugene G.: *See—*
Baker, Don R.; and Teach, Eugene G., 3,781,442.

Teach, Eugene G., to Stauffer Chemical Company. Substituted ureido dioxolanes and dioxanes and their utility as herbicides. 3,781,305, Cl. 260-340.900.

Teach, Eugene G., to Stauffer Chemical Company. Meta-carbanilate ethers. 3,781,327, Cl. 260-471.00c.

Teagle, William Thomas. Detachable mounting of dispenser machine parts. 3,780,915, Cl. 222-545.000.

Teagno, Vladimiro; and Campari, Luigi, to AMP Incorporated. Shroud for an electrical connector blade. 3,781,766, Cl. 339-107.000.

Technicon Instruments Corporation: *See—*
Engelhardt, Alvin, 3,781,120.
Groner, Warren; and George, Wilberdan Victor, 3,781,112.

Technology Service Corporation: *See—*
Lank, Gerald W.; and Pullon, Gerald E., 3,781,886.

Tecumseh Products Company: *See—*
Nutten, Warren D., 3,780,996.

Teichner, Stanislas: *See—*
Juillet, Francois; Teichner, Stanislas; and Formenti, Marc, 3,781,194.

Teijin Limited: *See—*

Fujita, Yutaka; Toda, Toshiki; and Shimada, Tsuneo, 3,781,350.
Izawa, Nobuharu; Toyoshima, Hiroshi; and Ikazaki, Koh, 3,780,405.
Shima, Takeo; Orsaki, Takanori; Oka, Isao; and Funakoshi, Wataru, 3,781,375.

Teikoku Piston Ring Co., Ltd.: *See—*
Kumabe, Junichiro; and Shimizu, Koichi, 3,781,022.

Tektronix, Inc.: *See—*
Horn, John J., 3,781,470.

Telefonaktiebolaget L M Ericsson: *See—*
Johannesson, Nils Olof, 3,781,477.

Telemeccanica Elettrica Officine Meccaniche Reunite S.p.A.: *See—*
Borghetti, Giuseppe, 3,781,501.

Telesco Brophey Limited: *See—*
Weber, Heinz, 3,780,748.

Tellerman, Edward M.: *See—*
Deniega, Jose Castillo; and Tellerman, Edward M., 3,780,958.

Temple, Ernest E.: *See—*
Giebel, Joseph L.; and Temple, Ernest E., 3,780,689.

Tenneco In.: *See—*
Hubbell, Franklin R., III, 3,780,826.

Ternes, Norman A. Retractable wheel for paper guiding cylinder. 3,780,925, Cl. 226-191.000.

Terrasi, Chris C., to Stack-Pac Corporation. Packaging construction. 3,780,929, Cl. 229-14.00c.

Teutsch, George J.: *See—*
Shapiro, Elliot L.; Teutsch, George J.; and Herzog, Hershel L., 3,781,276.

Texaco Inc.: *See—*
Christopher, Charles A.; Allen, Joseph C.; and Kolaian, Jack H., 3,780,808.
Paap, Hans J.; and Tanner, Harley L., 3,781,545.
Stamm, Ralph E., 3,780,590.

Texas Instruments, Incorporated: *See—*
Bodge, Clifford A., 3,781,839.
Cooper, Erwin E.; and Kennedy, Howard V., 3,781,559.
McKerreghan, Michael H., 3,781,457.
Morris, Marvin L., Jr.; Pope, Hermon L., Jr.; and Ruggiero, Edward M., 3,781,515.
Ornstein, Jacob L., 3,781,583.

Textron, Inc.: *See—*
Helm, Joan K., 3,781,238.

Theodore, Ares N.; and Labana, Santokh S., to Ford Motor Company. Powdered coating compositions containing glycidyl methacrylate copolymers with anhydride crosslinking agents and flow control agent. 3,781,379, Cl. 260-836.000.

Thiel, Max: *See—*
Kampe, Wolfgang; Fauland, Erich; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 3,781,273.
Witt, Ernst-Christian; Stach, Kurt; Thiel, Max; Schmidt, Felix Helmut; and Stork, Harald, 3,781,328.

Thiesen, Wolfgang: *See—*
Ploetz, Ulrich; and Thiesen, Wolfgang, 3,781,510.

Thomas, Albert J., Jr.: *See—*
Huskins, Chester W.; and Thomas, Albert J., Jr., 3,781,179.

Thomas, Andre G.; and Fetissoff Basile, to Etablissements Hutchinson Compagnie Nationale du Caoutchouc. Inflatable air mattresses and like articles. 3,780,388, Cl. 5-349.000.

Thomas, Carlton E., to KMS Industries, Inc. Method and apparatus for personal identification. 3,781,113, Cl. 356-71.000.

Thomas, Charles T., to United States of America, Air Force. Optical receiver with extended source discrimination. 3,781,547, Cl. 250-203.00r.

Thomas, Dalton A., 30% to Beasley, Hazel A., 20% to Thompson, Woodford R., Jr., 20% to Carter, Hugh and 20% to Murray, William K., mesne. Gear selector for a transmission. 3,780,840, Cl. 192-48.910.

Thomas, James C., III: *See—*
Sanford, Harry W., 3,780,618.

Thomas, Michael D.: *See—*
Martin, James M.; and Thomas, Michael D., 3,781,519.

Thomas, Otto, to Schneider, Jos., & Co. Optische Werke. Reversing drive with braking for optical components. 3,781,617, Cl. 318-261.000.

Thompson, John T.: *See—*
Anderson, Karl R., 3,781,758.

Thompson, John T.; and Gillemot, George K. Cable splice assembly and method. 3,781,461, Cl. 174-93.000.

Thompson, Richard M., to Hughes Aircraft Company. Waveguide window assembly. 3,781,726, Cl. 333-98.00p.

Thompson, Sheldon L., to Sun Oil Company of Pennsylvania. Stabilizing a hydrocracked lube oil by solvent extraction. 3,781,196, Cl. 208-96.000.

Thompson, Woodford R., Jr.: *See—*
Thomas, Dalton A., 3,780,840.

Thomson, Richard N.; and Walker, Michael F., to Dunlop Holdings Limited. Flame resistant seals. 3,781,021, Cl. 277-164.000.

Thornley, Derek, to Lucas, Joseph, (Industries) Limited. Locking arrangement for vehicle gearbox. 3,780,602, Cl. 74-850.000.

Thorpe, John Bernard Joseph: *See—*
Britland, Colin Morris; and Thorpe, John Bernard Joseph, 3,781,530.

Thullen, Philip: *See—*
Smith, Joseph L., Jr.; Thullen, Philip; and Kirtley, James L., Jr., 3,781,578.

Tibbling, Thure P. M.: *See—*
Ek, Leif V.; Wallin, Per L.; and Tibbling, Thure P. M., 3,780,866.

Tice, Edward Stephen: *See—*
Lilienthal, Peter Frederick, II; Remachandran, Karapurath; and Tice, Edward Stephen, 3,780,558.

Tidal Sales Corporation: *See—*
Quackenbush, Edward Clarke, 3,781,762.

Tideland Signal Corporation: *See—*
Jacobs, Thomas A., 3,781,853.

Timmerman, Julius W.: *See—*
Weston, Donald E.; and Timmerman, Julius W., 3,780,625.

Timofeev, Mikhail Mikhailovich: *See—*
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich, 3,780,428.

Titmus, Robert A.: *See—*
Bryson, Millard C.; McKinney, Joel D.; Titmus, Robert A.; and White, Frederick K., 3,781,197.

Toda, Toshiki: *See—*
Fujita, Yutaka; Toda, Toshiki; and Shimada, Tsuneo, 3,781,350.

Tokunaga, Ikuo, to Kabushiki Kaisha Suwa Seikosha. Timepiece dial with electrically-conducting foot. 3,780,519, Cl. 58-23.00c.

Tokunaga, Tsugiharu. Scilliloidglycoside containing poison compositions. 3,781,419, Cl. 424-84.000.

Tokuno, Masateru; and Sawada, Tetsuya, to Rengo Kabushiki Kaisha Rengo Co., Ltd. Web splicing apparatus. 3,780,960, Cl. 242-58.100.

Tokuzumi, Tadaichi: *See—*
Mori, Akikazu; Nara, Hideo; Kataoka, Toshiki; Kashiwa, Norio; Tokuzumi, Tadaichi; Horota, Yutaka; and Fujimura, Hiroshi, 3,781,253.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Nomura, Osamu; and Yajima, Kanichi, 3,781,597.
Yakata, Akio; and Kinoshita, Tsuneo, 3,781,811.

Tokyo Shibaura Electric Company, Ltd.: *See—*
Kubo, Moritada; and Takahashi, Yukiharu, 3,781,626.
Tahara, Hisayoshi; Sakurai, Mituo; and Yamada, Hayatoshi, 3,780,937.

Tomkins, Harold E., to Myers Double Tee Structures, Inc., mesne. Composite panel fastening device having interlock feature. 3,780,481, Cl. 52-265.000.

Tompkins, Neil R., to Halsey Harbester & Supply Co., Inc. Shaker head. 3,780,510, Cl. 56-328.0ts.

Tonari, Hirohiko, to Matsushita Electric Industrial Co., Ltd. UHF tuning mechanism. 3,780,594, Cl. 74-10.520.

Toogood, Graham John: *See—*
Weaver, Cedric David; and Toogood, Graham John, 3,781,149.

Tooth, David Michael: *See—*
Power, Basil Dixon; Oswald, Roger Derek; and Tooth, David Michael, 3,781,518.

Topham, Alan Eric; and Topham, Cedric Henry. Valves for controlling fluid flow. 3,780,983, Cl. 251-158.000.

Topham, Cedric Henry: *See—*
Topham, Alan Eric; and Topham, Cedric Henry, 3,780,983.

Topliss, John G., to Schering Corporation. 2-Polyfluoroloweralkylamino benzophenones. 3,781,360, Cl. 260-570.0ab.

Toray Industries, Inc.: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.

Toth, Tibor E., to Union Carbide Corporation. Full wave governor control system. 3,781,620, Cl. 318-331.000.

Toth, Tibor Endre, to Union Carbide Corporation. Arc working power supply with saturable reactor current control. 3,781,640, Cl. 321-18.000.

Totta, Paul A.: *See—*
Baker, Thoedore H.; Ghafghaichi, Majid; and Totta, Paul A., 3,781,609.

Toulis, William J. Engulfed superdirective arrays. 3,781,896, Cl. 343-754.000.

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Crawford, John T., 3,780,896.

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Townsend, Robert L.: *See—*
Kaufman, Peter; Colsen, F. Thomas; and Townsend, Robert L., 3,781,854.

Townsley, Malcolm G., to Wesley-Jessen, Inc. Method and apparatus for designing contact lenses. 3,781,096, Cl. 351-13.000.

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Toyoda Koki Kabushiki Kaisha: *See—*
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Toyoshima, Hiroshi: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Tremarco, Paul, to Edson Enterprises, Inc. Cam operated ignition point assembly. 3,781,494, Cl. 200-30.00a.
Tridan Tool & Machine, Inc.: *See—*
Ames, Ward A., 3,780,561.
Trident Engineering Co.: *See—*
Hughes, James S., Jr., 3,781,841.
Trikilis, Emmanuel M. Magnetic material and method of producing same. 3,781,661, Cl. 324-34.000.
Trocino, Frank S., to Bohemia Lumber Company, Incorporated. Method of separating bark components. 3,781,187, Cl. 162-93.000.
Troster, Helmut: *See—*
Fuchs, Otto; Spietschka, Ernst; Hohn, Jurgen; and Troster, Helmut, 3,781,302.
Trott, Gene F.; and Smith, William E., to General Electric Company. Method for making rigid foam and compositions using such method. 3,781,235, Cl. 260-2.5be.
Trowern, Howard M., Jr.: *See—*
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Trueblood, Robert Arthur, to Cornwell Company, Inc. Slide top desk. 3,781,074, Cl. 312-30.000.
Trumpf & Co., Firma: *See—*
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Lobowitz, Hyman R., 3,781,249.
Lubowitz, Hyman R., 3,781,240.
Tsilibes, George N.; D'Amico, Frank V.; and Hamm, John G., III, to Xerox Corporation. Fuser control system. 3,781,516, Cl. 219-216.000.
Tsukamoto, Masahide; and Ohtsuka, Tetsuro, to Matsushita Electric Industrial Co., Ltd. Method for changing the transparency of a liquid crystal cell. 3,781,088, Cl. 350-160.01c.
Tsuruishi, Yuki, to Kabushiki Kaisha Suwa Seikosha. Watch having tuning fork time standard. 3,780,520, Cl. 58-23.0tf.
Tsutsui, Yoshiro: *See—*
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Tucker, Robert L., to Seismograph Service Corporation. Borehole logging system with improved display and recording apparatus. 3,781,783, Cl. 340-18.0dc.
Tull, Roger J.: *See—*
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Tullis, Reuben C., to Manning Environmental Corporation, mesne. Liquid level indicator and flow measuring device. 3,781,624, Cl. 318-482.000.
Tullos, Aubrey R. Adjustable chuck assembly for capillary pen system. 3,781,908, Cl. 346-140.000.
Turlabor AG: *See—*
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Turnbull, John Peter: *See—*
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Turner, James Keith; and Riley, James Robert, to Gaston County Dyeing Machine Company. Jet dyeing apparatus. 3,780,544, Cl. 68-177.000.
Turner, Leslie Ashton Steele, to Airfix Industries, Limited. Sheet feeding. 3,780,559, Cl. 72-361.000.
Turzillo, Lee A. Means for producing cast-in-place structures in situ. 3,780,975, Cl. 249-1.000.
Tuss, John J., to Bendix Corporation, The. motion Motion mechanism and motion amplifying device therefor. 3,780,595, Cl. 74-25.000.
Tuttle, Charles H., to General Electric Company. High voltage resonant testing circuit. 3,781,667, Cl. 324-57.00r.
Tuvell, Melvin E.; and Dewitt, William J., to Ethyl Corporation. Sulfonate mixtures based on derivatives of olefins of the vinyl, vinylidene and internal types having from 12 to 16 carbon atoms per molecule. 3,781,339, Cl. 260-513.00r.
Tymczak, Romuald W., to Carborundum Company, The. Electrical heater. 3,781,527, Cl. 219-540.000.
UCB, Societe Anonyme: *See—*
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Ueda, Hiroyuki: *See—*
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Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, to Mita Industrial Company Limited. Liquid developers containing azo dyes. 3,781,208, Cl. 252-62.100.
Uhde, Friedrich, GmbH: *See—*
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Uhlig, Albert R., to Owens-Illinois, Inc. Method for blow molding plastic articles. 3,781,395, Cl. 264-89.000.
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Uhtenwoldt, Herbert R.; Crossman, Richard E.; and Caliri, Charles T., to Cincinnati Mialcron-Haeld Corp. Machine tool. 3,781,070. Cl. 308-5.00r.
Unger, Manfred, to Swiss Aluminium Ltd. Apparatus for the vertical multiple continuous casting of aluminium and aluminium alloys. 3,780,789, Cl. 164-283.00r.
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Ur, Amiram. Conductivity measuring system and conductivity cells therefor. 3,781,659, Cl. 324-30.00r.
Uramoto, Tatsuro. Openable bag. 3,780,781. Cl. 150-3.000.
Urbach, Roy J. G.: *See—*
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Urbanosky, Harold J., to Schlumberger Technology Corporation. Formation-testing tool for obtaining multiple measurements and fluid samples. 3,780,575, Cl. 73-152.000.
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Van Den Bosch, Francois J. G. Selective information retrieval systems. 3,781,847, Cl. 340-324.0al.
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van der Roer, Humphrey Alphons Victor, to Polytype AG. Device for placing cups on a moving carrier member. 3,780,885, Cl. 214-8.50a.
Van Ginkel, Johannes; and Van Heelsbergen, Teunis Robert, to U.S. Philips Corporation. Reduction cross-talk in double gap head. 3,781,834, Cl. 340-174.10f.
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Van Loon, Lambertus Jacob Willem; and Muilwijk, Dirk, to U.S. Philips Corporation. Regenerator for generating a pulse series which is to be stabilized on an incoming impulse series. 3,781,696, Cl. 328-164.000.
Van Osch, John H. System for taking and processing still pictures. 3,780,634, Cl. 95-31.0ca.
Van Patten, Robert E.; and Rogers, Dana B., to United States of America, Air Force. Pressure control system for G-suit. 3,780,723, Cl. 128-1.00a.
Vanguard Industries Inc.: *See—*
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Vargiu, Silvio; and Pitzalis, Mario, to Societa Italiana Resine S.I.R. S.p.A. Process for preparing epoxidic resins. 3,781,244, Cl. 260-47.0ep.
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Videon, John A. Weighing devices. 3,780,817, Cl. 177-136.000.
Vilkomerson, David Herman Raphael, to RCA Corporation. Holographic memory with light intensity compensation means. 3,781,830, Cl. 340-173.0lm.
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von Meyer, Walter G. Magnetic tic-tac-toe game. 3,781,013, Cl. 273-130.00b.
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Wagner, John W.; and Young, Paul M., to International Business Machines Corporation. Test probe apparatus. 3,781,681, Cl. 324-158.00p.
Wagner, Klaus; Eue, Ludwig; and Klauke, Erich, to Bayer Aktiengesellschaft. Cyano- and trifluoromethyl-substituted 6-nitroanilines. 3,781,323, Cl. 260-465.00e.
Wagner, Ruprecht, to Moeller & Neumann G.m.b.H. Plate turn-over mechanism. 3,780,882, Cl. 214-1.0qa.
Wagner, William. Pressurized liquid mixer and dispenser. 3,780,910, Cl. 222-95.000.
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Walker, Darrell W.; Farha, Floyd E., Jr.; and Bertus, Brent J., to Phillips Petroleum Company. Catalyst for oxidative dehydrogenation. 3,781,223, Cl. 252-437.000.
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Walz, Donald T.: *See—*
Berkoff, Charles E.; Sutton, Blaine M.; and Walz, Donald T., 3,781,434.
Walz, Jorgen; and Faust, Eberhard, to Recaro GmbH. and Co. Safety device for a vehicle seat. 3,781,061, Cl. 297-388.000.
Wandel u. Goltermann: *See—*
Dick, Rudolf, 3,781 669.
Ward Foods, Inc.: *See—*
Farmer, John, 3,780,645.
Ward, John W., to Union Oil Company of California. Catalytic hydrocracking of ammonia containing feedstocks. 3,781,199, Cl. 208-89.000.
Ward, William J., III; and Salemme, Robert M., to General Electric Company. Sulfonated polyxylene oxide as a permselective membrane for gas separations. 3,780,496, Cl. 55-16.000.
Warnant, Julien; and Jolly, Jean, to Roussel-UCLAF. Novel preparation of trienic steroids. 3,781,311, Cl. 260-397.450.
Warner, Ellis R., Jr.: *See—*
Miller, Blaine Monroe, Jr.; Buckman, Wayne T.; and Warner, Ellis R., Jr., 3,780,956.
Warren, Robert W.: *See—*
Scudder, Philmore M.; and Warren, Robert W., 3,781,345.
Warren, William Edward, to Bespak Industries Limited. Aerosol valves. 3,780,913, Cl. 222-402.240.
Warwick Electronics, Inc.: *See—*
Chapman, Steven J., 3,781,590.
Williams, Norman L.; and Ryan, Allen L., 3,780,965.
Wassilieff, Victor. Stoppers. 3,780,897, Cl. 215-41.000.
Watanabe, Kazuo; Kito, Yastami; Nazaki, Choji; Kono, Kiichi; Tsuzuki, Kanemitsu; and Motobayashi, Kozo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kabushiki Kaisha Toyota Chuo Kenkyusho and Kabushiki Kaisha Meidensha. Method and apparatus for drivin open-end spinning frame. 3,780,513, Cl. 57-93.000.
Waterbury, Richard N. Power operated animal feeding and watering device. 3,780,702, Cl. 119-51.130.
Watermann, Hans-Dieter, to Arn. Kickert Sohne. Motor-vehicle door latch with lock mechanism only actuatable with door closed. 3,781,045, Cl. 292-216.000.
Waters, Graham Thomas, to Imperial Chemical Industries, Limited. Textured core yarns. 3,780,515, Cl. 57-157.00r.
Watson, Arthur: *See—*
Locke, Walter Frederick; Watson, Arthur; and Edwards, Thomas Philip, 3,781,039.
Wawzonek, Stanley; and Gueldner, Richard C., to Iowa University of Iowa, State of. Process for preparing isocyanates. 3,781,319, Cl. 260-453.00p.
Weaver, Cedric David; and Toogood, Graham John, to Dowty Hydraulic Units Limited. Rotary fluid-pressure machines. 3,781,149, Cl. 418-131.000.
Weaver, George B., to Honeywell Information Systems, Inc. Apparatus for adaptively checking document thickness. 3,781,652, Cl. 328-1.000.
Webb, Frank Alan, to Martonair Limited. Rotary air motor. 3,780,624, Cl. 91-491.000.
Webb, George; and Malott, Bernard, to United States of America, Air Force. Multiple function safe and arm mechanism. 3,780,660, Cl. 102-70.02r.
Webb, John G., Jr.: *See—*
Gerst, Thomas E.; and Webb, John G., Jr., 3,781,716.
Weber, Heinz, to Telesco Brophey Limited. Collapsible umbrella. 3,780,748, Cl. 135-20.00r.
Weber, Kurt: *See—*
Siegrist, Adolf Emil; Liechti, Peter; Maeder, Erwin; Guglielmetti, Leonardo; Meyer, Hans Rudolf; and Weber, Kurt, 3,781,278.
Webster Electric Company, Inc.: *See—*
Dalziel, Donald F.; and Heide, Charles H., 3,781,742.
Wedemeyer, Karlfried: *See—*
Pawellek, Dieter; and Wedemeyer, Karlfried, 3,781,297.
Weeden, Otto P., Jr., to Honeywell Information Systems, Inc. Solid-state long-period timer. 3,781,573, Cl. 307-293.000.
Wehrli, Hansuli; and Jeger, Oskar, to Ciba-Geigy Corporation. Process for the production of 14β-hydroxy-Δ^{16}- and 7α-hydroxy-Δ4-steroids. 3,781,271, Cl. 260-239.55r.
Weicrtz, Axel Hugo. Internal combustion engine. 3,780,719, Cl. 123-188.00c.
Weiner, Norbert. Transformer assembly. 3,781,741, Cl. 336-192.000.
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., to Frosst, Charles E., & Co. Process for making 4-(3-amino-2-hydroxy propoxy)-1,2,5-thiadiazoles. 3,781,284, Cl. 260-247.100.
Weinz, Ernst August: *See—*
Batsch, Helmut; Jahnel, Benno; Weinz, Ernst August; Berger, Wolfgang; and Dickopp, Gerhard, 3,781,020.
Weisang, Joseph Edouard; Szabo, Georges; and Maurin, Jean, to Compagnie Francaise de Raffinage. Dehydration catalysts, particularly for the dehydration of diols. 3,781,222, Cl. 252-437.000.
Weisman, Abner I. Contraceptive. 3,780,730, Cl. 128-127.000.
Weiss, Donald C.: *See—*
Kuhn, Gerald D.; Peterson, Kenneth A.; Roeschlein, Eugene R.; Weiss, Donald C.; Weiss, Kenneth F.; and Zeph, David L., 3,781,776.
Weiss, Kenneth F.: *See—*
Kuhn, Gerald D.; Peterson, Kenneth A.; Roeschlein, Eugene R.; Weiss, Donald C.; Weiss, Kenneth F.; and Zeph, David L., 3,781,776.
Weiss, Martin Joseph: *See—*
Partridge, Ruth; and Weiss, Martin Joseph, 3,781,429.
Weiss, Morton A.; and Speckhart, Bernard S., to White Machine Co. Article storage and retrieval apparatus. 3,780,852, Cl. 198-181.000.
Weldon, Winfred D.: *See—*
Nickell, Claude H., 3,781,135.
Wells, Howard F., to Schlegel Manufacturing Co. Inc., The. Continuous molding method. 3,781,390, Cl. 264-47.000.

Wells, William T. Variable automatic transmission. 3,780,841, Cl. 192-61.000.

Welters, Reiner; and Russmann, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Light protection agent for cosmetic purposes. 3,781,417, Cl. 424-59.000.

Wemac Company: *See—*
Kellel, Allen, 3,780,980.

Wenner, John G., to Universal Oil Products Company. Sulfur oxides removal system. 3,780,498, Cl. 55-73.000.

Wentworth, William M., Sr. Wildlife feeder. 3,780,701, Cl. 119-51.00r.

Wentworth, William P.: *See—*
Melead, James J.; and Wentworth, William P., 3,780,697.

Werner, Charles E., to Mead Corporation, The. Roll cleaning apparatus for paper-making machines and the like. 3,780,396, Cl. 15-256.510.

Wesco Industries Corporation, mesne: *See—*
Deniega, Jose Castillo; and Tellerman, Edward M., 3,780,958.

Wescom, Inc.: *See—*
Roge, Ralph R., 3,781,480.

Wesley-Jessen, Inc.: *See—*
Townsley, Malcolm G., 3,781,096.

Westergren, George A.; Fish, Warren H.; Crooks, Stanley R.; and Koland, David G., to Whirlpool Corporation. Vacuum cleaner construction. 3,781,460, Cl. 174-52.00r.

Western Electric Company, Incorporated: *See—*
Dornberger, Georg Christian Ernst, 3,781,666.
Gresho, William Milan, 3,780,442.
Lilienthal, Peter Frederick, II; Remachandran, Karapurath; and Tice, Edward Stephen, 3,780,558.
Studeny, Henry G., 3,780,848.

Westinghouse Air Brake Company: *See—*
Darrow, John O. G.; and Vaughn, Thomas C., 3,781,541.
Haydo, Andrew G., 3,780,837.
Mokrytzki, Boris; and Hammond, Peter W., 3,781,614.
Mokrytzki, Boris; and Meier, Udo, 3,781,615.
Mokrytzki, Boris, 3,781,616.
Staples, Crawford E., 3,781,540.
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Westinghouse Electric Corporation: *See—*
Alvino, William M.; and Koryak, William R., 3,781,237.
Blewitt, Donald D.; and Ayers, David L., 3,781,747.
Corson, Charles A., 3,781,690.
De Caro, Artitide R., 3,781,582.
Grunert, Kurt A., 3,781,500.
Grunert, Kurt A.; Dauer, John J., Jr.; and Dobrosielski, Stephen S., 3,781,728.
Hopkins, Richard H.; Roland, George W.; Steinbruegge, Kenneth B.; and Partlow, William D., 3,781,707.
Huber, Charles J., 3,781,868.
Jackson, Edward J., 3,781,695.
Jessee, Ralph D., 3,781,634.
Kircher, Paul J., 3,781,521.
Kruper, Andrew P.; Reeves, John R.; and Vercellotti, Leonard C., 3,781,836.
Mattern, John, 3,781,871.
Meyer, Lloyd E., 3,781,739.
Rahaim, Thomas J.; and Kish, Leslie G., 3,781,125.
Ravas, Richard J., 3,781,773.
Rushing, Frank C.; and Gilbert, Lynford W., 3,781,095.
White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., 3,781,574.
Wiley, Roy A., 3,781,769.
Wolf, Charles B.; and Akers, Ronald R., 3,781,449.
Wood, Carl O., 3,781,127.

Westinghouse Electronic Corporation: *See—*
Shuey, Kenneth C.; and Baker, Donald E., 3,781,572.

Weston, Donald E.; and Timmerman, Julius W., to Porter, H. K., Company, Inc. Operating mechanism for high tension electric switch gear. 3,780,625, Cl. 91-418.000.

Westphal, Richard C.: *See—*
Finestone, Arnold B.; Westphal, Richard C.; and Brac, Charles, Jr., 3,781,383.

Wetzler, Justin J.: *See—*
Rosenfeld, Howard; and Wetzler, Justin J., 3,780,543.

Wheeler, Edward L., to Uniroyal, Inc. N-(4-alpha, alpha-dimethylbenzylphenyl)-1-or- 2-naphthylamines. 3,781,361, Cl. 260-570.00r.

Wheeler, Lionel H.: *See—*
Clavin, Edward A.; and Wheeler, Lionel H., 3,780,591.

Whipple, Roger B.; and Miller, Allan F., to Outboard Marine Corporation. Single clutch and throttle lever combined with a throttle warm up lever. 3,780,842, Cl. 192-.096.

Whirlpool Corporation: *See—*
Westergren, George A.; Fish, Warren H.; Crooks, Stanley R.; and Koland, David G., 3,781,460.

Whitaker, George C., to Wolff Sales Engineering Company. Impact control for impact wrenches. 3,780,603, Cl. 81-52.300.

White, Albert H.: *See—*
Kampe, Robert F.; and White, Albert H., 3,780,771.

White, Edward A.; and Bunting, James H., to Bowmor Instrument Corporation. Calculator display circuit. 3,781,852, Cl. 340-324.00r.

White, Frederick K.: *See—*
Bryson, Millard C.; McKinney, Joel D.; Titmus, Robert A.; and White, Frederick K., 3,781,197.

White Machine Co.: *See—*
Weiss, Morton A.; and Speckhart, Bernard S., 3,780,852.

White, Marvin H.; McCann, David H., Jr.; Mack, Ingham A. G.; and Blaha, Franklyn C., to Westinghouse Electric Corporation. Coherent sampled readout circuit and signal processor for a charge coupled device array. 3,781,574, Cl. 307-304.000.

White, Robert L., to General Motors Corporation. Pushbutton shift mechanism. 3,780,597, Cl. 74-483.0pm.

White, William E., Jr.; and Billingsly, Lloyd E., to Hydrotech Services, Inc. Method of joining pipes in a hostile environment. 3,780,421, Cl. 29-466.000.

White, William T. Study device. 3,780,451, Cl. 35-9.00e.

Whitehead, Robert C., Jr.; and Honeywell Lester R., Jr., to Honeywell, Inc. Differential pressure responsive apparatus. 3,780,588, Cl. 73-398.0ar.

Whitfill, William A., Jr.: *See—*
Sawin, Frederick C.; and Whitfill, William A., Jr., 3,781,778.

Whitlock, Inc.: *See—*
Evans, Arthur J.; and Morin, Joseph C., 3,780,991.

Whitson, Bobbie L.; and Morgan, John A., to Phillips Petroleum Company. Apparatus including an equalization chamber for discontinuous venting of a vessel. 3,780,761, Cl. 137-565.000.

Whitworth, Clyde Jesse, Jr.: *See—*
Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Dean, Robert, 3,781,381.

Wicks, Norman L. Fork. 3,781,053, Cl. 294-55.500.

Widmayer, Don F., to Controlled Environment Systems, Inc. Electric current control apparatus. 3,781,598, Cl. 315-107.000.

Wiegert, Philip E., to Mallinckrodt Chemical Works. Nitrilotriacyltriimino-tris-(2,4,6-triiodobenzoic acid) compounds. 3,781,338, Cl. 260-501.110.

Wiesener, Robert W., to Programmed & Remote Systems Corporation. Reactor vessel inspecation device. 3,780,571, Cl. 73-67.80s

Wight, David C.: *See—*
Caiati, Frank P.; and Wight, David C., 3,781,824.

Wilbur, Robert L., to Eastern Company, The. Valve structure for gas operated horn. 3,780,694, Cl. 116-112.000.

Wilcox, Jack W., to Abex Corporation. Vane pump with pressure ramp tracking assist. 3,781,145, Cl. 418-1.000.

Wild, Jost: *See—*
Kappeler, Heinrich; and Wild, Jost, 3,781,333.

Wildhaber, Ernest. Optical scanner with laser. 3,781,078, Cl. 350-6.000.

Wildman, Alexander J., to Consyne Corporation. Orthodontic bracket. 3,780,437, Cl. 32-14.00a.

Wiley, Roy A., to Westinghouse Electric Corporation. Wiring device such as female connector with deformable insulating housing element for maintaining contact alignment. 3,781,769, Cl. 339-189.00r.

Wilhelm Karl-Heinz, to Draiswerke GmbH., Firma. Screen arrangement for stirring mills. 3,780,957, Cl. 241-172.000.

Wilkinson, David B. Forced air heater. 3,781,165, Cl. 432-62.000.

Williams, Benjamin F., to Benwilco Inc. Rotary engine having axially sliding vanes. 3,780,709, Cl. 123-8.230.

Williams, Francis A.; and Dudley, Harvey H., to Eastman Kodak Company. Automatic or presettable diaphragm apparatus. 3,781,099, Cl. 352-141.000.

Williams Instruments, Inc., mesne: *See—*
Williams, Robert A., 3,781,676.

Williams, Malcolm; and Cockshott, Charles Peter, to Lucas, Joseph, (Industries) Limited. Inductor alternator. 3,781,580, Cl. 310-168.000.

Williams, Norman L.; and Ryan, Allen L., to Warwick Electronics, Inc. Tape recorder. 3,780,965, Cl. 242-204.000.

Williams, Robert A., to Williams Instruments, Inc., mesne. Contact structure for test probe. 3,781,676, Cl. 324-72.500.

Williams, Robert E.: *See—*
Ayers, Robert C., Jr.; Bayless, Jack H.; Graham, John W.; Lloyd, James R.; Loth, William D.; and Williams, Robert E., 3,780,809.

Williamson, Walter A., mesne: *See—*
Freyling, Edward N., Jr., 3,781,860.

Wilms, Carl Alfred: *See—*
Barron, Charles Dwain; Geczy, Bela; and Wilms, Carl Alfred, 3,780,815.

Wiltshire, Arthur J. Apparatus for inserting a flexible preform in a mold. 3,781,155, Cl. 425-392.000.

Win, Maung Hla: *See—*
McDonnell, Robert William; and Win, Maung Hla, 3,781,228.

Windmoller & Holscher: *See—*
Mirar', Horst; and Schner, Karl Heinz, 3,780,796.

Winner, Richard N.: *See—*
Ernstoff, Michael N.; Fehr, Eric R.; Hoffman, William C.; and Winner, Richard N., 3,781,465.

Winslow, Lester M., to United States of America, Navy. Backward wave prevention for a TWT helix. 3,781,588, Cl. 315-3.500.

Wirth, Wolf-Dieter: *See—*
Muller, Erwin; Wirth, Wolf-Dieter; Blahak, Johannes; and Rohr, Harry, 3,781,233.

Wisniewski, Raymond B., to United States of America, Army. Pulse ratio modulation valve. 3,780,763, Cl. 137-599.000.

Wisotzky, Otto G.; Blackburn, Tom L.; and Urbach, Roy J. G., to GTE Automatic Electric Laboratories, Incorporated. Pulse-correcting system for a telephone signaling system. 3,781,482, Cl. 179-16.0ea.

Witt, Ernst-Christian; Stach, Kurt; Thiel, Max; Schmidt, Felix Helmut; and Stork, Harald, to Boehringer Mannheim Gesellschaft mit

beschrankter Haftung. Phenoxy-alkyl-carboxylic acid compounds. 3,781,328, Cl. 260-471.00r.

Witte, Josef: *See—*
Pampus, Gottfried; Schon, Nikolaus; Witte, Josef; and Marwede, Gunter, 3,781,257.

Witten, Rolf Groth. Heat-reflecting window pane. 3,781,077, Cl. 350-1.000.

Woelffer, Neill C., to Jacobsen Manufacturing Company. Rotary lawn mower cutter bar with bi-level cutter. 3,780,509, Cl. 56-295.000.

Wolf, Charles B.; and Akers, Ronald R., to Westinghouse Electric Corporation. Nonconsumable electrode for an electric arc furnace with integrated cooling and electrically conducting means. 3,781,449, Cl. 13-18.000.

Wolf, Milton; Sellstedt, John H.; and Rosen, Harry, to American Home Products Corporation. Method of producing 2-halo-3-substituted indoles. 3,781,300, Cl. 260-326.150.

Wolff Sales Engineering Company: *See—*
Whitaker, George C., 3,780,603.

Wollnik, Hermann. Coil arrangement for adjusting the focus and/or correcting the aberration of streams of charged particles by electromagnetic deflection, particularly for sector field lenses in mass spectrometers. 3,781,732, Cl. 335-213.000.

Wolpers, Jurgen, to Chemische Werke Huls Aktiengesellschaft. Process for the vulcanization of homo-or copolymers of conjugated dienes. 3,781,250, Cl. 260-79.50b.

Wolverine Brass Works; a division of Wolverine Industries, Inc.: *See—*
De Vries, Robert Wopke, 3,780,758.

Wood, Bonnie G.: *See—*
Wood, Gary J.; and Wood, Bonnie G., 3,780,604.

Wood, Carl O., to Westinghouse Electric Corporation. Centrifugal fan inlet vane capacity control. 3,781,127, Cl. 415-147.000.

Wood, Gary J.; and Wood, Bonnie G. Split socket wrench and method of using same. 3,780,604, Cl. 81-64.000.

Wood, Geoffrey Brian. Chimney liners. 3,780,639, Cl. 98-58.000.

Wood, Harrison F.; and Bernstein, Sidney. Test for hemolytic streptococci and test media therefor. 3,781,192, Cl. 195-100.000.

Wood, Lawrence H.: *See—*
Eichelberger, William E.; and Wood, Lawrence H., 3,781,846.

Woodie, Paul E., to American Totalisator Company, Inc. Selective punch. 3,780,939, Cl. 234-115.000.

Woodward, John W., to GTE Automatic Electric Laboratories, Incorporated. Trunk selection scanning circuit. 3,781,485, Cl. 179-18.0fg.

Worm, Manfred: *See—*
Bormann, Dieter; and Worm, Manfred, 3,781,283.

Worters, Allen J.: *See—*
Gicca, Francis A.; Passavant, Francis C.; and Worters, Allen J., 3,781,850.

Wortman, Donald E. Valveless fluid pump. 3,781,143, Cl. 417-557.000.

Wossner, Gerhard: *See—*
Pollmann, Fritz; and Wossner, Gerhard, 3,781,727.

Wriggins, Donald H.: *See—*
Fouks, Philip H.; and Wriggins, Donald H., 3,780,386.

Wright, Raymond C., to Westinghouse Air Brake Company. Manual latch retriever apparatus for car uncoupler. 3,780,879, Cl. 213-159.000.

Wu, Yu-Lin; and Hudson, Paul S., to Phillips Petroleum Company. Disproportionation of alkali metal salts of aromatic carboxylic acids. 3,781,341, Cl. 260-515.00p.

Wulff, Goldwyn L. Hypodermic syringe holder and injector device. 3,780,734, Cl. 128-218.00r.

Wymore, Charles E.; and Dahlberg, Clayton P., to Burroughs Corporation. Addressing system responsive to a transfer vector for accessing a memory. 3,781,812, Cl. 340-172.500.

Wynkoop, Raymond; and Kohn, Edward M., to Sun Research and Development Co. Process for making electrode grade coke. 3,781,198, Cl. 208-86.000.

W4: Pains-Wessex - Wessex Limited: *See—*
Murray, Dudley Charles, 3,780,656.

Xerox Corporation: *See—*
Buddendeck, Gerald A.; Hubler, Lawrence C.; Heiler, Paul S.; and Koch, Gilbert E., 3,781,004.
Gallo, Charles F., 3,781,585.
Gerace, Robert E., 3,781,548.
Meagher, Thomas, 3,781,105.
Rosenthal, Jerome A., 3,781,848.
Ruhland, John, 3,781,107.
Skamra, Dale William, 3,781,517.
Tsilibes, George N.; D'Amico, Frank V.; and Hamm, John G., III, 3,781,516.

Yahle, Daniel I., to United States of America, Navy. Reusable pressure release valve. 3,780,759, Cl. 137-467.000.

Yajima, Kanichi: *See—*
Nomura, Osamu; and Yajima, Kanichi, 3,781,597.

Yakata, Akio; and Kinoshita, Tsuneo, to Tokyo Shibaura Electric Co., Ltd. Memory protective systems for computers. 3,781,811, Cl. 340-172.500.

Yamada, Hayatoshi: *See—*
Tahara, Hisayoshi; Sakurai, Mituo; and Yamada, Hayatoshi, 3,780,937.

Yamada, Yasuo: *See—*
Kishino, Shigeo; Yamada, Yasuo; Kurahashi, Yoshio; and Kume, Toyohiko, 3,781,386.

Yamamoto, Hisao; Inaba, Shigeho; Hirohashi, Toshiyuki; Akatsu, Mitsuhiro; Maruyama, Isamo; and Izumi, Takahiro, to Sumitomo Chemical Company, Ltd. 2-Aminomethyl-indole derivatives. 3,781,299, Cl. 260-326.150.

Yamamoto, Katsuro, to Bridgestone Liquefied Gas Company, Ltd. Low temperature liquefied gas tank of a membrane type. 3,780,900, Cl. 220-9.01g.

Yamamura, Katsumi, to Kabushiki Kaisha Suwa Seikosha. Display device for electronic calculator. 3,781,862, Cl. 340-336.000.

Yamanaka, Yoshio: *See—*
Sakai, Hiroshi; Hamada, Satoshi; Yamanaka, Yoshio; Ito, Isao; Izumi, Zenji; Kitagawa, Hideji; Mukoyama, Eiji; Suzuki, Zennosuke; Kato, Tadashi; and Hosaka, Shuntaro, 3,781,248.

Yamazaki, Yoshio, to Kabushiki Kaisha Suwa Seikosha. Display device for electronic desk calculator. 3,781,865, Cl. 340-336.000.

Yao, Cheng, to Factory Mutual Research Corporation. Method of fire protection using recirculation of combustion products. 3,780,811, Cl. 169-12.000.

Yatani, Kozo: *See—*
Aoki, Katsuo; Yatani, Kozo; Kometani, Eishi; and Izuhara, Seiji, 3,781,423.

Yatsuk, Vladimir Grigorievich: *See—*
Grom, Jury Ivanovich; and Yatsuk, Vladimir Grigorievich, 3,781,645.

Yatsuk, Vladimir Grigorievich. Independently controlled inverter with universal commutating circuit. 3,781,644, Cl. 321-45.00c.

Yawata Chemical Industry Co., Ltd.: *See—*
Kusunoki, Yasuo; Okazaki, Hiroshi; Sato, Yoshinori; and Sano, Eiichi, 3,781,292.

Yoshida, Kenichi; and Miyamoto, Yoshio, to Sumitomo Electric Industries, Ltd. Leaky coaxial cable. 3,781,725, Cl. 333-84.00r.

Yoshida, Makoto, to Citizen Watch Co., Ltd. Alarm timepiece. 3,780,522, Cl. 58-38.000.

Yoshida, Toshio: *See—*
Kaneko, Keiji; and Yoshida, Toshio, 3,781,101.

Yoshihiro, Yoshimoto; Usami, Hiroshi; and Okazaki, Toshiyoshi, to Fujitsu Limited. Synchronous control system adapted for a numerically controlled machine. 3,781,629, Cl. 318-632.000.

Yoshizawa, Keiichi: *See—*
Oishi, Masaaki; Takahashi, Yoshinaga; and Yoshizawa, Keiichi, 3,780,649.

Young, James L.: *See—*
Geiger, Franklin O.; and Young, James L., 3,780,669.

Young, Paul M.: *See—*
Wagner, John W.; and Young, Paul M., 3,781,681.

Youtsey, Karl J.: *See—*
Carnanhan, Robert D.; and Youtsey, Karl J., 3,780,772.

Ysteboe, Howard T.: *See—*
Manacini, Lloyd; and Ysteboe, Howard T., 3,781,760.

Yuuki, Tasuku: *See—*
Nonaka, Shunsuke; Yuuki, Tasuku; and Hara, Kouichi, 3,781,577.

Zadow, Herbert, to Victory Kidder Limited. Guillotines or the like machines. 3,780,610, Cl. 83-643.000.

Zaid, Melvin, to Colt's Inc. Frangible projectile. 3,780,657, Cl. 102-41.000.

Zajkowski, Arthur J., to International Harvester Company. Means for extending wires through the center pivot of an articulated vehicle. 3,781,037, Cl. 280-241.000.

Zakumbaeva, Gaukhar Daulenovna: *See—*
Sokolsky, Dmitry Vladimirovich; Zakumbaeva, Gaukhar Daulenovna; Zhubanov, Kair Akhmetovich; Mazin, Evgeny Petrovich; Scheolov, Nikolai Illarionovich; Fokin, Evgeny Pavlovich; and Livanov, Vladimir Arkadievich, 3,781,227.

Zdinak, William D.: *See—*
Roberts, Robert E.; and Zdinak, William D., 3,780,470.

Zecher, Wilfried; and Merten, Rudolf, to Bayer Aktiengesellschaft. Process for the production of polyimides by reacting a Schiff base with a cyclic acid anhydride. 3,781,246, Cl. 260-78.0tf.

Zegers, Leo Eduard, to U.S. Philips Corporation. Error-Correcting data transmission system. 3,781,795, Cl. 340-146.1be.

Zeidler, Guenter, to Siemens Aktiengesellschaft. Receiver for laser beams. 3,781,550, Cl. 250-211.00j.

Zenith Radio Corporation: *See—*
Dietch, Leonard; and Lerner, Martin L., 3,781,076.

Zeph, David L.: *See—*
Kuhn, Gerald D.; Peterson, Kenneth A.; Roeschlein, Eugene R.; Weiss, Donald C.; Weiss, Kenneth F.; and Zeph, David L., 3,781,776.

ZF-Borg Warner GmbH Industriegebit: *See—*
Dach, Hansjorg; Bordowsky, Karl Heinz; and Bucksch, Manfred, 3,780,601.

Zhubanov, Kair Akhmetovich: *See—*
Sokolsky, Dmitry Vladimirovich; Zakumbaeva, Gaukhar Daulenovna; Zhubanov, Kair Akhmetovich; Mazin, Evgeny Petrovich; Scheolov, Nikolai Illarionovich; Fokin, Evgeny Pavlovich; and Livanov, Vladimir Arkadievich, 3,781,227.

Zimmer, Kurt; and Schneider, Wilhelm, to Beche & Grohs GmbH. Double-acting press with hydraulically coupled hammer and anvil. 3,780,560, Cl. 72-407.000.

Zimmer Manufacturing Company: *See—*
Quello, Henry A., 3,780,731.

Ziolko, Walter; and Stoeck, Paul F., to International Harvester Company. Shock and vibration dampening mount assembly. 3,781,058, Cl. 296-35.00r.

Zipser, Frederick S., M.D.: *See*—
Hagen, Thomas E., 3,781,677.
Zirlis, Joseph V., to H. N. Industries Inc. Water purification apparatus and cartridge therefor. 3,780,867, Cl. 210-266.000.
Zoeton Corporation: *See*—
Siddall, John B., 3,781,308.
Zoni, Giorgio, to Italfarmaco S.p.A. Pharmaceutical composition having analgesic and antiphlogistic activities. 3,781,439, Cl. 424-273.000.
Zorev, Nikolai Nikolaevich; Chernykh, Viktor Vasilievich; Stanislavsky, Lazar Yankelevich; Timofeev, Mikhail Mikhailovich; Kudryavtsev, Ivan Vasilievich; Isaev, Alexei Ilich; Grinchenko, Nikolai Grigorievich; Spivak, Boris Volkovich; Belov, Vladimir Alexanrovich; Kozik, Adolf Efimovich; Shavrin, Adolf Ivanovich; and Sobolev, Jury Vasilievich. Method of making generator rotor of turbogenerator unit. 3,780,428, Cl. 29-598.000.
Zubalik, Stanley G. Drinking straw. 3,780,944, Cl. 239-33.000.
Zucchinelli, Mario: *See*—
Porta, Paolo Della; Zucchinelli, Mario; and Pisani, Cesare, 3,780,501.
Zweig, Leon A., to Flow Technology Corporation. Peristaltic pump with adjustable tensioning means. 3,781,142, Cl. 417-477.000.

LIST OF REISSUE PATENTEES

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Alessi, Samuel P., to Borg-Warner Corp. Hard facing alloy composition and method of manufacture. Re. 27,851, 12–25–73, Cl. 106—1.

Borg-Warner Corp.: *See*—
Alessi, Samuel P. Re. 27,851.

Britt Tech Corp.: *See*—
Nortsrud, Iven R., and Threlkeld. Re. 27,855.

Ceramic Cooling Tower Co.: *See*—
Frohwerk, Paul A. Re. 27,853.

Eastman Kodak Co.: *See*—
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Eisenberg, Bernard C., to Solbern Corp. Spear packing apparatus. Re. 27,852, 12–25–73, Cl. 53—123.

Frohwerk, Paul A., to Ceramic Cooling Tower Co. Modular floating water-cooling system. Re. 27,853, 12–25–73, Cl. 239—11.

Kibler, Charles J.: *See*—
Weissberger, Arnold, and Kibler. Re. 27,848.

Nortsrud, Iven R., and J. H. Threlkeld, to Britt Tech Corp. Cleaning apparatus with relief control valve. Re. 27,855, 12–25–73, Cl. 239—126.

Schoerner, Roger J., to Southwire Co. Insulated telephone cable. Re. 27,854, 12–25–73, Cl. 174—113.

Solbern Corp.: *See*—
Eisenberg, Bernard C. Re. 27,852.

Southwire Co.: *See*—
Schoerner, Roger J. Re. 27,854.

Threlkeld, John H.: *See*—
Nortsrud, Iven R., and Threlkeld. Re. 27,855.

Watts, Glen Armon. Two-way plow with synchronized guided tail wheel. Re. 27,850, 12–25–73, Cl. 172—212.

Weissberger, Arnold, and C. J. Kibler, to Eastman Kodak Co. Yellow forming couplers. Re. 27,848, 12–25–73, Cl. 96—100.

Wortman, Donald E. Dynamic action valveless artificial heart utilizing dual fluid oscillator. Re. 27,849, 12–25–73, Cl. 3—1.

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American Filtrona Corp.: *See*—
Berger, Richard M. 229,725.

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Morrow, William B. 229,693.
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BIO Research Glass, Inc.: *See*—
Dragotta, Robert. 229,689.

Babbitt, John H., Jr., R. G. Boyer, A. E. Olt, Jr., P. E. Schuck, and S. L. Stark, to Caterpillar Tractor Co. Tractor cab. 229,687, 12–25–73, D14—27.

Bard, C. R., Inc.: *See*—
Ericson, Richard E. 229,724.

Becker, Robert W., and M. H. Boldt, to Zenith Radio Corp. Speaker enclosure. 229,701, 12–25–73, Cl. D26—14.

Bednarczuk, Daniel, and A. T. Milton. Knee guard. 229,643, 12–25–73, D2—27.

Berger, Richard M., to American Filtrona Corp. Filtered cigarette. 229,725, 12–25–73, Cl. D85—6.

Blazey, Lawrence, D. Silverstrom, and E. Rocker, to Century Products, Inc. Child's car seat. 229,646, 12–25–73, Cl. 6—9.

Bobrick, Mitchell: *See*—
Wince, Vearl S., and Bobrick. 229,713.

Boldt, Melvin H.: *See*—
Becker, Robert W., and Boldt. 229,701.

Boone, Edgar. Reel for holding electric wire. 229,668, 12–25–73, D8—220.

Bott, Winston F. Storefront awning. 229,690, 12–25–73, Cl. D21—6.

Bound, Lloyd R., to Texas Instruments, Inc. Sensor housing for an alarm system. 229,720, 12–25–73, Cl. D72—1.

Boyce, Frank J., to Stow Manufacturing Co. Portable wire reels. 229,669, 12–25–73, Cl. D8—222.

Boyer, Ronald G.: *See*—
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Brooke, Barton E., Jr. Table. 229,652, 12–25–73, Cl. D6—175.

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Babbitt, John H., Jr., Boyer, Olt, Schuck, and Stark. 229,687.

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Blazey, Lawrence, Silverstrom, and Rocker. 229,646.

Cook, David C., Publishing Co.: *See*—
Odell, Russell B. 229,703.
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Corini, Louis J., to Melbro Corp. Modular display unit. 229,651, 12–25–73, Cl. D6—171.

Croyle, Jack V., and H. P. Ashton, to Dart Industries Inc. Serving bowl and closure or the like. 229,654, 12–25–73, Cl. D7—18.

Cyren, Gunnar, to Dansk Designs Ltd. Coaster. 229,655, 12–25–73, Cl. D7—45.

Cyren, Gunnar, to Dansk Designs Ltd. Pitcher. 229,657, 12–25–73, Cl. D7—65.

Danjczek, William E., to Koh-I-Noor Radiograph, Inc. Lead box. 229,673, 12–25–73, Cl. D9—184.

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Davis, Myron F., and W. Furlani, to International Business Machines Corp. Cabinet design for data processing equipment. 229,697, 12–25–73, Cl. D26—5.

Decision Data Computer Corp.: *See*—
Richardson, Thomas L., Kersten, and Johnson. 229,700.

Dietz, R. E. Co.: *See*—
Knapp George A., Nitsch, Stube, and Steltzer. 229,714.

Dorsa, Richard L. Waffle or the like. 229,642, 12–25–73, Cl. D1—18.

Dragotta, Robert, to BIO Research Glass, Inc. Cell culture vessel or the like. 229,689, 12–25–73, Cl. D16—1.

Dugan-Chapman, Charles, to Steward Plastics Ltd. Tray for preparing seed propagation. 229,708, 12–25–73, Cl. D35—3.

Ericson, Richard E., to C. R. Bard, Inc. Surgical clamp. 229,724, 12–25–73, Cl. D83—12.

Esterline Corp.: *See*—
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Felton, Mickey L., to Esterline Corp. Combined stylus and ink reservoir. 229,722, 12–25–73, Cl. D74—17.

Feth, Karl G. Security partition for police vehicles. 229,688, 12–25–73, Cl. D14—6.

Finn, Richard J. Pipe or similar device. 229,726, 12–25–73, Cl. D85—8.

Ford, William E.: *See*—
Winsett, Walter P. 229,709.

Frawley, Paul F., to John Inglis Co., Ltd. Appliance handle. 229,666, 12–25–73, Cl. D8—169.

Friedman, Harry, to Jet Aer Corp. Knife. 229,662, 12–25–73, Cl. D7—150.

Furlani, Walter: *See*—
Davis, Myron F., and Furlani. 229,697.

Gammon, William A. Barbecue cooker. 229,660, 12–25–73, Cl. D7—107.

Ganger, Richard J., to Gruber Systems, Inc. Lavatory. 229,692, 12–25–73, Cl. D23—58.

Garcia, Humberto A. Roaster. 229,656, 12–25–73, Cl. D7—64.

Garcia, Richard R., to Miracle Candle Co. Display rack. 229,649, 12–25–73, Cl. D6—25.

Genaro, Donald M., to The Singer Co. Sewing machine carrying case or similar article. 229,727, 12–25–73, Cl. D87—1.

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Nelson, James G. 229,671.

Grimes, Gary S., to Questor Corp. Nurser. 229,723, 12–25–73, Cl. D83—8.

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Hatton, Sylvia A. Signaling garment. 229,721, 12–25–73, Cl. D72—1.

Hebel, Walter, Kommanditgesellschaft: *See*—
Kretzer, Erich. 229,698.

Hehs, Allen B., to Bud Radio Inc. Flip-top instrument cabinet. 229,699, 12–25–73, Cl. D26—5.

Hendrickson, Ruth E. Appliance cover. 229,653, 12–25–73, Cl. D6—269.

Hildebrand, Mark L. Architectural unit. 229,677, 12–25–73, Cl. D13—1.

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Hildebrand, Mark L. House. 229,682, 12–25–73, Cl. D13—1.
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Hildebrand, Mark L. Architectural unit. 229,684, 12–25–73, Cl. D13—1.
Hildebrand, Mark L. Housing module. 229,685, 12–25–73, Cl. D13—1.
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Holmberg, Gote E. Y. Buckle for safety belts. 229,645, 12–25–73, Cl. D2—408.
Holophane Co., Inc.: *See*—
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Howard, Fred, and D. O'Neill, to Howard Displays, Inc. Display stand for flat articles. 229,647, 12–25–73, Cl. D6—24.
Howard, Fred, and D. O'Neill, to Howard Displays, Inc. Display stand. 229,648. 12–25–73, Cl. D6—24.
Hull, Richard B. Twin hull boat. 229,719, 12–25–73, Cl. D71—1.
Inglis, John, Co., Ltd.: *See*—
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Koch, Robert G., to Johns-Manville Corp. Decorative panel or similar article. 229,676, 12–25–73, Cl. D13—1.
Koh-I-Noor Radiograph, Inc.: *See*—
Danjczek, William E. 229,673.
Kretzer, Erich, to Walter Hebel, Kommanditgesellschaft. Separable magnetic holder for sheet-like material. 229,698, 12–25–73, Cl. D26—1.
Kuncz, Frank, Jr. Pouring spout for a paint can or the like. 229,675, 12–25–73, Cl. D9—290.
Lambertson, Theodore C. Mobile cooking cart. 229,661, 12–25–73. Cl. D7—108.
Lewis, Scott. Card game score holder for attachment to table corner. 229,706, 12–25–73. Cl. D34—13.
Lindy Pen Co., Inc.: *See*—
Vogel, Jerome P. 229,712.
Maxwell, James D. Fishing net yoke. 229,691, 12–25–73, Cl. D22—22.
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Corini, Louis J. 229,651.
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Garcia, Richard R. 229,649.
Mixon, James A. Mobile double diaphragm pump or the like. 229,717. 12–25–73, Cl. D65—1.
Morita, Robert Y. Wheeled, dual-access clothes hamper. 229,663. 12–25–73, Cl. D7—163.
Morrow, William B., to Aqua-Mist Inc. Air scoop cover for a humidifier unit. 229,693. 12–25–73. Cl. D23—146.
Morrow, William B., to Aqua-Mist Inc. Humidifier unit receptacle for attachment to heating system air conveying duct and the like. 229,695. 12–25–73. Cl. D23—146.
Murnan, Leo R. Fish cleaning tool. 229,659, 12–25–73, Cl. D7—106.
Nelson, James G., to Gold Seal Vineyards, Inc. Bottle. 229,671. 12–25–73, Cl. D9—47.
Neuwirth, Frances: *See*—
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Nowak, Frank A. Adjustable dial angle meter. 229,715, 12–25–73. Cl. D52—6.
Odell, Russell B., to David C. Cook Publishing Co. Puppet. 229,703, 12–25–73, Cl. D34—2.
Odell, Russell B., to David C. Cook Publishing Co. Puppet. 229,704, 12–25–73, Cl. D34—2.
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Oxel, Berton R., to The Hoover Co. Toaster end panel with cord storage. 229,658, 12–25–73, Cl. D7—93.
Pambello, Samuel M. Lamp. 229,710, 12–25–73, Cl. D48—20.
Persson, Helge. Shoe sole. 229,644, 12–25–73, Cl. D2—320.
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Platte, Richard L., to Hoover Ball and Bearing Co. Jug. 229,670, 12–25–73, Cl. D9—40.
Poff, Richard B. Lamp fixtures. 229,711, 12–25–73, Cl. D48—23.
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Grimes, Gary S. 229,723.
Quigg, Donald J., to Phillips Petroleum Co. Egg tray or the like. 229,674, 12–25–73, Cl. D9—190.
Richardson, Thomas L., B. Kersten, and C. T. Johnson, to Decision Data Computer Corp. Data recorder. 229,700, 12–25–73, Cl. D26—5.
Rochford, Paul E., and F. Neuwirth, to General Electric Co. Wall plate. 229,667, 12–25–73, Cl. D8—182.
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Schmidt, Gerald W., and A. Sims, to California R&D Center. Combined toy tractor and plow. 229,707, 12–25–73, Cl. D34—15.
Schmitt, Jack B., to Sunbeam Corp. Top panel for electric humidifier. 229,694, 12–25–73, Cl. D23—146.
Schramm, Buford J. Helicopter fuselage. 229,718, 12–25–73, Cl. D71—1.
Schuck, Paul E.: *See*—
Babbitt, John H., Jr., Boyer, Olt, Schuck, and Stark. 229,687.
Shirley, Carl S., to General Educational Technology Corp. Rear projection viewer. 229,716, 12–25–73, Cl. D61—1.
Silverstrom, David: *See*—
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Torlone, John T. Miniature shrine or the like. 229,702, 12–25–73, Cl. D29—23.
Van Geem, John D. Bottle crate. 229,672, 12–25–73, Cl. 9—177.
Vogel, Jerome P., to Lindy Pen Co., Inc. Cigarette lighter. 229,712. 12–25–73, Cl. D48—27.
Wilmot, Paul C. Protective latch cover. 229,665, 12–25–73, Cl. D8—137.
Wince, Vearl S., and M. Bobrick, to Holophane Co., Inc. Postop luminaire. 229,713, 12–25–73, Cl. D48—31.
Winsett, Marion H.: *See*—
Winsett, Walter P. 229,709.
Winsett, Walter P., 50% each to Marion H. Winsett, and William E. Ford. Narrow silt ditcher. 229,709, 12–25–73, Cl. D39—1.
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233 3,780,580
302 3,780,581
320 3,780,582
343R 3,780,583
349 3,780,584
362SC 3,780,585
374 3,780,586
398AR 3,780,588
398R 3,780,587
418 3,780,589
422TC 3,780,590
457 3,780,592

CLASS 74
5R 3,780,593
10.52 3,780,594
25 3,780,595
473P 3,780,596
483PB 3,780,597
501M 3,780,598
516 3,780,599
519 3,780,600
762 3,780,601
850 3,780,602

CLASS 76
67.5R 3,780,570

CLASS 81
52.3 3,780,603
64 3,780,604

CLASS 83
4 3,780,605
23 3,780,606
49 3,780,607
375 3,780,608
420 3,780,609
643 3,780,610
751 3,780,611

CLASS 84
1.01 3,781,450
1.16 3,781,451
1.28 3,781,452
173 3,780,612
421 3,780,613

CLASS 86
1R 3,780,614

CLASS 89
1A 3,780,615
1.8 3,780,616
1.811 3,780,617
150 3,780,618

CLASS 90
15 3,780,619

CLASS 91
6 3,780,620
290 3,780,621
296 3,780,622
418 3,780,625
459 3,780,623
491 3,780,624

CLASS 93
1G 3,780,626
37R 3,780,627
82 3,780,628

CLASS 95
1R 3,780,629
4.5 3,780,630
10C 3,780,631
11L 3,780,632
19 3,780,633
31CA 3,780,634
3,780,635
64R 3,780,636
93 3,780,637

CLASS 96
100 Re.27,848

CLASS 98
31 3,780,638
58 3,780,639
110 3,780,640

CLASS 99
347 3,780,642
450.7 3,780,643
455 3,780,644

CLASS 100
117 3,780,645
155 3,780,646
232 3,780,647

CLASS 101
93C 3,780,648
3,780,649
3,780,650
115 3,780,651
124 3,780,652
269 3,780,669
363 3,780,670

CLASS 102
19.2 3,780,653
22 3,780,654
31 3,780,655
37.6 3,780,656
41 3,780,657
52 3,780,658
70B 3,780,659
70.2P 3,780,661
70.2R 3,780,660
89 3,780,662

CLASS 104
1R 3,780,663
9 3,780,664
69 3,780,665
88 3,780,666
148MS 3,780,667
3,780,668

CLASS 105
197A 3,780,671
253 3,780,672
376 3,780,673

CLASS 106
1 Re.27,851

CLASS 110
8A 3,780,676
8C 3,780,677
8E 3,780,675
8R 3,780,674

CLASS 112
79A 3,780,678
121.27 3,780,679
3,780,680
219A 3,780,681
262 3,780,682

CLASS 113
116HH 3,780,684

CLASS 114
.5D 3,780,685
.5F 3,780,686
41 3,780,687
145R 3,780,683
208R 3,780,688
218 3,780,690
221A 3,780,689

CLASS 115
12R 3,780,691

CLASS 116
5 3,780,692
70 3,780,693
112 3,780,694
136 3,780,695

CLASS 117
95 3,781,173
227 3,781,275

CLASS 118
49.5 3,780,696
65 3,780,697
125 3,780,698
420 3,780,699
503 3,780,700

CLASS 119
51R 3,780,701
51.13 3,780,702
53 3,780,703

CLASS 122
149 3,780,704
451R 3,780,705

CLASS 123
8.01 3,780,706
8.13 3,780,707
8.17 3,780,708
8.23 3,780,709
8.47 3,780,710
32EA 3,780,711
41.08 3,780,712
117A 3,780,713
122AA 3,780,714
122AB 3,780,715
139AS 3,780,716
148AC 3,780,717
179G 3,780,718
188C 3,780,719

CLASS 124
11A 3,780,720

CLASS 126
21A 3,780,721
270 3,780,722

CLASS 127
46A 3,781,174

CLASS 128
1A 3,780,723
2.05T 3,780,725
3,780,726
2.06R 3,780,727
2.1B 3,780,724
83.5 3,780,728
94 3,780,729
127 3,780,730
169 3,780,731
214F 3,780,732
215 3,780,733
218R 3,780,734
223 3,780,735
231 3,780,736
260 3,780,737
277 3,780,738
283 3,780,739
350R 3,780,740
516 3,780,741
588 3,780,742

CLASS 131
17 3,780,743
143 3,780,744
212A 3,780,745

CLASS 132
83R 3,780,746

CLASS 134
43 3,780,747

CLASS 135
20R 3,780,748

CLASS 136
7 3,781,175
212 3,781,176

CLASS 137
13 3,780,749
3,780,750
3,780,751
68 3,780,752
3,780,753
82 3,780,754
110 3,780,755
119 3,780,756
205 3,780,757
454.6 3,780,758
467 3,780,759
516.25 3,780,760
565 3,780,761
596 3,780,762
599 3,780,763
613 3,780,764
3,780,765
624.2 3,780,766
625.3 3,780,767
625.48 3,780,768
819 3,780,769
823 3,780,770
829 3,780,771

CLASS 138
37 3,780,772
89 3,780,773

CLASS 139
87 3,780,774
122W 3,780,775

CLASS 141
207 3,780,776

CLASS 144
3N 3,780,777
39 3,780,778

193A 3,780,779
238 3,780,780

CLASS 149

6 3,781,177
19.2 3,781,179
19.9 3,781,178
21 3,781,180

CLASS 150

3 3,780,781

CLASS 152

356 3,780,782
3,780,783

CLASS 156

72 3,781,181

CLASS 157

1 3,780,784
1.24 3,780,785

CLASS 159

4A 3,780,786

CLASS 161

5 3,781,182
109 3,781,183
165 3,781,184
217 3,781,185
253 3,781,186

CLASS 162

93 3,781,187
233 3,781,188

CLASS 164

35 3,780,787
82 3,780,788
283R 3,780,789
392 3,780,790

CLASS 165

9 3,780,791
3,780,792
39 3,780,796
47 3,780,793
55 3,780,797
58 3,780,794
80 3,780,795
120 3,780,801
128 3,780,798
150 3,780,799
166 3,780,800

CLASS 166

59 3,780,803
89 3,780,802
162 3,780,804
266 3,780,805
275 3,780,806
3,780,808
278 3,780,807
314 3,780,809

CLASS 168

4 3,780,810

CLASS 169

12 3,780,811
15 3,780,812

CLASS 172

212 Re.27,850
438 3,780,813

CLASS 173

2 3,780,814
43 3,780,815
152 3,780,816

CLASS 174

11R 3,781,453
3,781,454
15C 3,781,455
23R 3,781,456
52R 3,781,460
52S 3,781,457
84C 3,781,458
93 3,781,461
94R 3,781,459
113R Re.27,854
121B 3,781,462

CLASS 176

28 3,781,189
59 3,781,190
86R 3,781,191

CLASS 177

136 3,780,817
256 3,780,818

CLASS 178

5.4BD 3,781,465
5.4CD 3,781,463
5.4 3,781,464
6.8 3,781,466
3,781,467
3,781,468
7.3D 3,781,469
7.3R 3,781,470
7.82 3,781,471
22 3,781,472
3,781,473
25 3,781,474

CLASS 179

1J 3,781,475
2TV 3,781,477
15AL 3,781,478
15.55T 3,781,479
16EA 3,781,482
16F 3,781,480
3,781,481
18FG 3,781,485
18GF 3,781,484
18F 3,781,483
100.2C 3,781,476
3,781,486
100.2K 3,781,488
100.2R 3,781,489
100.2S 3,781,490
100.2Z 3,781,487
107R 3,781,491
156A 3,781,492

CLASS 180

14A 3,780,819
44M 3,780,820
44R 3,780,821
114 3,780,822
121 3,780,823

CLASS 181

31B 3,780,824
33G 3,780,825
36B 3,780,826
43 3,780,827

CLASS 182

111 3,780,829
206 3,780,[illegible]

CLASS 184

105A 3,780,830

CLASS 187

9 3,780,831

CLASS 188

3R 3,780,832
9 3,780,833
18A 3,780,834
74 3,780,835
79.5SC 3,780,836
195 3,780,837

CLASS 190

49 3,780,838

CLASS 192

.096 3,780,842
4A 3,780,839
48.91 3,780,840
61 3,780,841

CLASS 193

35TE 3,780,843

CLASS 194

4 3,780,844

CLASS 195

100 3,781,192

CLASS 197

18 3,780,845
19 3,780,846

CLASS 198

25 3,780,847
3,780,848
30 3,780,849
31AC 3,780,850
175 3,780,851
181 3,780,852

CLASS 199

63 3,780,853

CLASS 200

6A 3,781,493
30A 3,781,494
50A 3,781,495
61.45R 3,781,496
61.58B 3,781,497
84C 3,781,498
166BC 3,781,501
166SD 3,781,499
166K 3,781,500
226 3,781,502

CLASS 203

8 3,781,193

CLASS 204

162R 3,781,194

CLASS 206

46R 3,780,854
50 3,780,855
56AB 3,780,856
63.2 3,780,857

CLASS 208

57 3,781,195
86 3,781,198
89 3,781,199
96 3,781,196
120 3,781,197

CLASS 209

73 3,780,858
3,780,859
167 3,780,860

CLASS 210

21 3,781,200
27 3,781,201
80 3,780,861
84 3,780,862
97 3,780,863
152 3,780,864
195 3,780,865
198C 3,780,866
266 3,780,867
317 3,780,869
321 3,780,870
333 3,780,868
471 3,780,871
493 3,780,872

CLASS 211

49D 3,780,873
65 3,780,874
115 3,780,875
184 3,780,876

CLASS 212

8B 3,780,877
59R 3,780,878

CLASS 213

159 3,780,879

CLASS 214

1GE 3,780,881
1QA 3,780,882
1R 3,780,880
2.5 3,780,883
8.5A 3,780,885
8.5D 3,780,884
.7CA 3,780,886
17CB 3,780,887
18K 3,780,888
33 3,780,889
36 3,780,890
138C 3,780,891
152 3,780,892
3,780,893
505 3,780,894
731 3,780,896
770 3,780,895

CLASS 215

41 3,780,897
43R 3,780,898

CLASS 219

10.49 3,781,503
3,781,504
3,781,505
3,781,506
69G 3,781,507
121P 3,781,508
125 3,781,509
130 3,781,510
137 3,781,511
3,781,512
3,781,513
211 3,781,514
216 3,781,515
3,781,516
3,781,517
271 3,781,518
273 3,781,519
309 3,781,520
442 3,781,521
462 3,781,522
3,781,523
522 3,781,524
532 3,781,525
538 3,781,526
540 3,781,527
546 3,781,528

CLASS 220

5R 3,780,899
9LG 3,780,900
46P 3,780,901
54 3,780,902
55.3 3,780,904
71 3,780,903
97D 3,780,905
113 3,780,906

CLASS 221

2 3,780,907
48 3,780,908
85 3,780,909

CLASS 222

95 3,780,910
101 3,780,911
282 3,780,912
402.24 3,780,913
407 3,780,914
545 3,780,915
555 3,780,916

CLASS 223

2 3,780,917

CLASS 224

4H 3,780,918
6 3,780,919
49 3,780,920

CLASS 225

2 3,780,921

CLASS 226

92 3,780,922
151 3,780,923
155 3,780,924
191 3,780,925

CLASS 228

1 3,780,926
3 3,780,927
13 3,780,928

CLASS 229

14BE 3,780,930
14C 3,780,929
27 3,780,931
37R 3,780,932
40 3,780,933
52B 3,780,934

CLASS 233

1A 3,780,935
20R 3,780,936
24 3,780,937

CLASS 234

1 3,780,938
115 3,780,939

CLASS 235

92GA 3,781,529
150.1 3,781,533
150.26 3,781,530
151.3 3,781,531
151.32 3,781,532
151.34 3,781,534

CLASS 236

15A 3,780,940
49 3,780,941

CLASS 239

1 3,780,942
8 3,780,943
11 Re.27,853
33 3,780,944
102 3,780,945
107 3,780,946
126 Re.27,855
177 3,780,947
236 3,780,948
291 3,780,949
306 3,780,950
333 3,780,951
424.5 3,780,952
526 3,780,953
560 3,780,954
672 3,780,955

CLASS 240

1.3 3,781,535
2.25 3,781,536
8.16 3,781,537
49 3,781,538
52R 3,781,539

CLASS 241

34 3,780,956
172 3,780,957

CLASS 242

47.12 3,780,958
55.18 3,780,959
58.1 3,780,960
67.3R 3,780,961
72 3,780,962
82 3,780,963
129 3,780,964
204 3,780,965

CLASS 244

1SA 3,780,966
3.16 3,780,967
3.22 3,780,968
123 3,780,969
152 3,780,970

CLASS 246

128 3,781,541
3,781,542
130 3,781,543
345T 3,781,540

CLASS 248

309 3,780,971
313 3,780,972
342 3,780,973
411 3,780,974

CLASS 249

1 3,780,975
14 3,780,976
15 3,780,977
135 3,780,978

CLASS 250

201R 3,781,546
203R 3,781,547
206R 3,781,548
206 3,781,552
211J 3,781,549
3,781,550
214P 3,781,551
220 3,781,545
226 3,781,554
227R 3,781,555
302 3,781,556
320 3,781,557
332 3,781,558
333 3,781,560
334 3,781,559
341 3,781,910
352 3,781,561
360 3,781,562
362 3,781,544
3,781,563
505 3,781,564
553 3,781,553

CLASS 251

138 3,780,980
144 3,780,981
158 3,780,983
210 3,780,982
282 3,780,984
309 3,780,985
315 3,780,986

CLASS 252

8.55C 3,781,203
8.7 3,781,202
8.75 3,781,204
12.6 3,781,205
51.5R 3,781,206
62.1 3,781,207
3,781,208
62.3R 3,781,209
62.54 3,781,210
3,781,211
89 3,781,212
188.3 3,781,213
301.1R 3,781,216
301.1W 3,781,217
301.3W 3,781,215
356 3,781,218
415 3,781,219
429B 3,781,220
432 3,781,221
437 3,781,222
3,781,223
447 3,781,224
455Z 3,781,225
3,781,226
466J 3,781,227
539 3,781,228

CLASS 254

8R 3,780,987
100 3,780,988
173R 3,780,989
173 3,780,990

CLASS 259

18 3,780,991
19 3,780,992
97 3,780,993
191 3,780,994
193 3,780,995

CLASS 260

2.5BE 3,781,229
3,781,231
3,781,235
2.5B 3,781,230
2.5R 3,781,233
17.4GC 3,781,232
18N 3,781,234
22TN 3,781,214
23.7M 3,781,236
29.1SB 3,781,237
29.2TN 3,781,238
30.6R 3,781,239
37N 3,781,240
38 3,781,241
45.7P 3,781,242
47EP 3,781,244
75R 3,781,245
78TF 3,781,246
3,781,249
78.4D 3,781,247
79.3M 3,781,248
79.5B 3,781,250
80.71 3,781,251
80.73 3,781,252
85.3R 3,781,253
85.5R 3,781,254
86.7 3,781,256
87.1 3,781,255
87.5C 3,781,243
88.2DE 3,781,257
92.1R 3,781,265
92.1 3,781,258
93.5C 3,781,259
94.7A 3,781,260
3,781,262
3,781,263
94.7 3,781,261
112R 3,781,264
112.5 3,781,272
157 3,781,266
210AB 3,781,268
210R 3,781,267
210.5 3,781,269
211.5R 3,781,273
3,781,274
239BB 3,781,270
239.1 3,781,277
239.55R 3,781,271
239.55 3,781,276
240CA 3,781,278
3,781,279
240F 3,781,281
240J 3,781,280
243C 3,781,282
3,781,283
247.1 3,781,284
3,781,285
250R 3,781,286
251AQ 3,781,287
260 3,781,288
268C 3,781,290
288R 3,781,289
290H 3,781,291
290P 3,781,292
293.57 3,781,293
294.8A 3,781,294
295R 3,781,295
295.5R 3,781,296
305 3,781,297
326.15 3,781,299
3,781,300
326.5FN 3,781,298
327M 3,781,301
328 3,781,302
338 3,781,303
340 3,781,304
340.9 3,781,305
343.3 3,781,306
347.8 3,781,307
3,781,308
348R 3,781,309
374 3,781,310
397.45 3,781,311
3,781,312
402 3,781,313
410.9 3,781,314
429.7 3,781,315
3,781,316
430 3,781,317
448R 3,781,318
453PC 3,781,321
453PH 3,781,320
453P 3,781,319
455R 3,781,322
465D 3,781,324
465E 3,781,323
468D 3,781,325
470 3,781,326
471C 3,781,327
471R 3,781,328
479C 3,781,330
3,781,331
479S 3,781,329
484A 3,781,334
486D 3,781,336
486H 3,781,335
486R 3,781,332
3,781,333
491 3,781,337
501.11 3,781,338
513R 3,781,339
515P 3,781,340
3,781,341
3,781,343
515R 3,781,342
524R 3,781,344
3,781,345
525 3,781,346
3,781,347
534S 3,781,348
535P 3,781,349
535R 3,781,350
559R 3,781,351
561R 3,781,352
562B 3,781,354
562P 3,781,353
564R 3,781,355
3,781,356
3,781,357
566B 3,781,358
570AB 3,781,360
570R 3,781,361
570.9 3,781,359
583N 3,781,362
583P 3,781,363
601R 3,781,364
606 3,781,365
609D 3,781,367
609R 3,781,366
611R 3,781,368
613D 3,781,369
615F 3,781,370
619A 3,781,372
619D 3,781,371
635C 3,781,373
644 3,781,374
668D 3,781,375
683.2 3,781,377
683.3 3,781,376
824R 3,781,378
836 3,781,379
3,781,380
857PE 3,781,381
874 3,781,382
876 3,781,383

879 3,781,384
930 3,781,385
953 3,781,388
958 3,781,386
979 3,781,387
986 3,781,389

CLASS 261

72 3,780,996
77 3,780,997
91 3,780,998
109 3,780,999
124 3,781,000

CLASS 264

47 3,781,390
53 3,781,391
65 3,781,392
89 3,781,393
3,781,394
3,781,395
140 3,781,396
142 3,781,397
146 3,781,398
171 3,781,399
210F 3,781,400
228 3,781,401
243 3,781,402

CLASS 266

41 3,781,001
3,781,002

CLASS 269

40 3,781,003

CLASS 271

10 3,781,004
18R 3,781,006
186 3,781,005

CLASS 272

84 3,781,007

CLASS 273

19 3,781,008
54B 3,781,009
85C 3,781,010
86G 3,781,011
95R 3,781,012
130B 3,781,013
131AC 3,781,014
153R 3,781,015

CLASS 274

4A 3,781,018
4C 3,781,016
3,781,017
4E 3,781,019
38 3,781,020

CLASS 277

164 3,781,021
213 3,781,022

CLASS 279

19.6 3,781,023
20 3,781,024
83 3,781,025

CLASS 280

11.13B 3,781,026
11.26 3,781,027
11.35K 3,781,028
11.35T 3,781,029
36C 3,781,030
62 3,781,031
124A 3,781,032
124R 3,781,033
150SB 3,781,034
150.5 3,781,035
289 3,781,036
421 3,781,037
493 3,781,038

CLASS 285

1 3,781,039
110 3,781,040
111 3,781,041
339 3,781,042
363 3,781,043

CLASS 292

200 3,781,044
216 3,781,045
251.5 3,781,047
264 3,781,046

CLASS 293

23MC 3,781,057
89 3,781,048
99 3,781,049

CLASS 294

1CA 3,781,050
1R 3,781,051
25 3,781,052
55.5 3,781,053
81R 3,781,054
83A 3,781,055
112 3,781,056

CLASS 296

35R 3,781,058
137B 3,781,059

CLASS 297

68 3,781,060
379 3,781,062
388 3,781,061

CLASS 303

6C 3,781,063
21F 3,781,064
71 3,781,065

CLASS 305

11 3,781,066
35EB 3,781,067

CLASS 307

106 3,781,565
116 3,781,566
147 3,781,567
232 3,781,568
234 3,781,569
235R 3,781,571
238 3,781,570
252T 3,781,572
293 3,781,573
304 3,781,574

CLASS 308

4R 3,781,068
5R 3,781,069
3,781,070
9 3,781,071
15 3,781,072
238 3,781,073

CLASS 310

8.8 3,781,575
9.1 3,781,576
9.7 3,781,577
52 3,781,578
68A 3,781,579
168 3,781,580
215 3,781,581

CLASS 312

3D 3,781,074
208 3,781,075

CLASS 313

37 3,781,582
85S 3,781,583
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273	3,781,439	331	3,781,444	329	3,781,154		3,781,160	115	3,781,162	234	3,781,167
300	3,781,440	CLASS 425		392	3,781,155	CLASS 426		266	3,781,163	CLASS 444	
	3,781,446	80	3,781,150	424	3,781,156	482	3,780,641	291	3,781,164	1	3,781,909
308	3,781,415										

CLASSIFICATION OF DESIGNS

D01—	18	229,642		65	229,657		177	229,672	D14—	6	229,688		14G	229,701	D52—	6R	229,715
D02—	27	229,643		93	229,658		184	229,673		27B	229,687	D29—	23A	229,702	D61—	1N	229,716
	320	229,644		106	229,659		190	229,674	D16—	1R	229,689	D34—	2R	229,703	D65—	A	229,717
	408	229,645		107	229,660		290	229,675	D21—	6B	229,690			229,704	D71—	J	229,718
D06—	9	229,646		108	229,661	D13—	1A	229,682	D22—	22	229,691			229,705		Q	229,719
	24	229,647		150	229,662			229,683	D23—	58	229,692		13A	229,706	D72—	A	229,720
		229,648		163	229,663		J	229,676		146	229,693		15AN	229,707		E	229,721
	25	229,649		164	229,664			229,677			229,694	D35—	3A	229,708	D74—	17B	229,722
	97	229,650	D08—	137	229,665			229,678			229,695	D39—	1B	229,709	D83—	8A	229,723
	171	229,651		169	229,666			229,679		150	229,696	D48—	20	229,710		12R	229,724
	175	229,652		182	229,667			229,680	D26—	1M	229,698		23R	229,711	D85—	6C	229,725
	269	229,653		220	229,668			229,681		5C	229,697		27	229,712		8A	229,726
D07—	18	229,654		222	229,669			229,684			229,699		31	229,713	D87—	1R	229,727
	45	229,655	D09—	40	229,670			229,686			229,700		32C	229,714	D88—	4	229,728
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